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UNITED STATES GOVERNMENT

ANNUAL REPORT OF THE

Surgeon General of the Public Health and Marine-Hospital Service of the United States

FOR THE FISCAL YEAR

1911

WASHINGTON
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TREASURY DEPARTMENT.

Document No. 2635.

Public Health and Marine-Hospital Service.

OPERATIONS

OF THE

UNITED STATES PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE

1911

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LETTER OF TRANSMITTAL.

Treasury Department,
Office of the Secretary,
Washington, December 16, 1911.

Sir: In accordance with section 9 of the act of Congress approved July 1, 1902, entitled "An act to increase the efficiency and change the name of the Marine-Hospital Service," I have the honor to transmit herewith the annual report of the Surgeon General of the Public Health and Marine-Hospital Service of the United States for the fiscal year 1911.

Respectfully,

Franklin MacVeagh,
Secretary.

The **Speaker of the House of Representatives.**

ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE.

Treasury Department,
Bureau of Public Health and
Marine-Hospital Service,
Washington, D. C., November 1, 1911.

Sir: I have the honor to submit for transmission to Congress, in accordance with the act of July 1, 1902, the following report of the transactions of the Public Health and Marine-Hospital Service of the United States for the fiscal year ended June 30, 1911, together with some subsequent transactions of special importance up to the present date.

This is the fortieth annual report of the service in the one hundred and thirteenth year of its existence, and the tenth annual report under its present name.

Administrative Organization.

The bureau in Washington contains seven divisions, through which the widely varied operations of the service are conducted. These divisions are as follows:

(1) Scientific Research and Sanitation.
(2) Foreign and Insular Quarantine and Immigration.
(3) Domestic (Interstate) Quarantine.
(4) Sanitary Reports and Statistics.
(5) Marine Hospitals and Relief.
(6) Personnel and Accounts.
(7) Miscellaneous.

Each of these divisions is in charge of a medical officer of the service, and within their respective and well-defined jurisdictions come all the operations of the service, including the supervision of the officers and other employees. By means of special bureau regulations their several functions are coordinated and their operations are brought under the direct personal supervision of the Surgeon General.

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SCIENTIFIC RESEARCH AND SANITATION.

Scientific investigations relating to contagious and infectious diseases, and other matters pertaining to the public health have been continued as in previous years. The field of operations has been as broad as the facilities would permit, and some important results have been achieved.

Administrative supervision over the several laboratories and special investigations has been maintained through the Bureau Division of Scientific Research. The number and organization of the laboratories remain the same, and with the exception of the appointment of Prof. E. C. Franklin as chief of the Division of Chemistry of the Hygienic Laboratory, no important changes were made in their personnel.

Greater specialization has been necessary by reason of the character of the investigations. Three junior officers of the service completed the student course in the Hygienic Laboratory, being thus made competent for work of research character. The facilities of the laboratory have been been extended to certain State and local officials on request of their State boards of health.

Some of the investigations begun in previous years have been completed. Notable among these are the studies into the origin and prevalence of typhoid fever in the District of Columbia, extending from 1906 to 1909, inclusive. The results are incorporated in bulletins of the Hygienic Laboratory Nos. 35, 44, 52, and 78.

As an aid to investigations already begun and to be undertaken, the authority of Congress was obtained to admit to marine hospitals, for purposes of scientific study, cases of contagious and infectious diseases not to exceed 10 in any one hospital at one time. Advantage has been taken of this provision to study intestinal parasites of man at the marine hospital, Wilmington, N. C., and pellagra at the marine hospital, at Savannah, Ga. There have, therefore, been created two additional centers for research work, and it is expected that others will be established at hospitals of the service adapted to the purpose.

The importance of research work in the interest of the public health has been demonstrated not only in the United States, but in foreign countries, such as Germany, which owes its eminence in public health matters largely to scientific and statistical work. These activities are an important function of the Federal Government, and should be well provided for.

There is pressing need of a larger appropriation for the maintenance of the Hygienic Laboratory. Adequate funds should also be provided for special investigations of diseases that endanger the public welfare, such as typhoid fever, tuberculosis, and pellagra. The last-named disease threatens to become a national calamity. It has attracted public attention only since 1907, yet it is safe to say

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LETTER OF TRANSMITTAL.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, December 16, 1911.

SIR: In accordance with section 9 of the act of Congress approved July 1, 1902, entitled "An act to increase the efficiency and change the name of the Marine-Hospital Service," I have the honor to transmit herewith the annual report of the Surgeon General of the Public Health and Marine-Hospital Service of the United States for the fiscal year 1911.

Respectfully,

FRANKLIN MACVEAGH,
Secretary.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

nurses assisted in carrying out the prophylactic measures as compared with the number of secondary cases which developed in a like number of homes where visiting nurses were not given an opportunity to assist in carrying out proper prophylaxis.

The annual typhoid fever death rate for 100,000 population in Chicago for the years 1900 to 1910, inclusive, was as follows:

Year.	Death rate.	Year.	Death rate.
1900	19.8	1906	18.5
1901	29.1	1907	18.2
1902	44.5	1908	15.8
1903	31.8	1909	12.6
1904	19.6	1910	13.7
1905	16.9		

The city's typhoid death rate for 1910, the year in which it may be assumed that the amount of typhoid infections spread from the bedsides of persons sick with the disease was reduced, was lower than for any other year for which there is record, except 1909. Judging by the occurrence of pronounced milk outbreaks in the summer and fall seasons, Dr. Lumsden believes that milk was much more highly operative as a factor in the distribution of the infection in 1910 than it was in 1909, and other factors, except contact, may also have been operative Aside from the actual prevention of contact infection, the organization of measures in one of the largest American cities to bring about better reporting of cases and their sanitary care, and the educational effect that followed, were ample justification for the energy expended in the work.

INVESTIGATIONS OF TYPHOID FEVER IN DES MOINES, IOWA.

On account of urgent requests in December from the secretary of the State board of health of Iowa for investigation of an epidemic of typhoid fever at Des Moines, Passed Asst. Surg. L. L. Lumsden was detailed for this service.

Dr. Lumsden began this investigation December 22 and completed it by January 7, 1911. It comprised a sanitary survey of the Raccoon River from Valley Junction to the filter galleries from which the water supply of Des Moines is obtained, bacteriological examinations of the water supply, an epidemiological study of about 50 individual cases of the disease, a review of the epidemiological data previously collected by the city health office, a study of the death records at the State health office, an inspection of a number of places such as dairies, grocery stores, and ice-cream manufactories, where foods are sold or prepared for sale, a careful inquiry into the origin and distribution of fruits, vegetables and shellfish sold in the city during the period in which the outbreak was caused, a clinical study of a number of cases of the disease, a survey of the general sanitary conditions of the city, and a consideration of all other conditions which appeared to be likely to throw any light upon the situation.

Dr. Lumsden's report contains the followings conclusions:

The outbreak of typhoid fever in Des Moines in November and December, 1910, was caused, beyond reasonable doubt, by infection disseminated in the city water obtained from the Raccoon River and Raccoon River Basin. A small proportion of the cases may have been caused by infection received immediately through personal contact, milk, vegetables, fruits, etc., but the vast majority of the cases resulted from infection distributed primarily and chiefly in the city water supply. This conclusion is based on the following points of evidence:

(*a*) The season of the occurrence and the explosive character of the outbreak.

(*b*) The distribution of the disease in relation to the distribution of the city water.

(*c*) The pollution of Raccoon River at points within a few miles upstream from the location of the filtration galleries.

(*d*) The results of the bacteriological examinations of the water, showing that even about a month after the scraping away of the upper layer of sand from over the filtration galleries crossing under the river and the working of a centrifugal pump on these galleries in order to secure rapid or forced filtration had been discontinued, the filtration was still inefficient to remove from the water, to a reasonably reliable extent, such disease-producing microorganisms as the water in the river and the river basin may have contained.

(*e*) The correspondence in time between the period of special forcing of the filtration galleries and the period of main causation of the outbreak.

(*f*) The decline in the outbreak in due time, according to what is known about the viability of the typhoid bacillus in water and sand, after the forcing of the filtration had been discontinued and after the time in which the bulk of whatever infection may have reached the sand of the new basins, as a result of the lack of proper sanitary precautions while the work on these new basins was going on, probably would have elapsed.

(*g*) The results of the epidemiological studies of the cases, which implicate the city water supply and which definitely eliminate, except perhaps as secondary and minor factors, all other media which, according to the whole history of the epidemiology of typhoid fever, could be reasonably considered to have served to convey infection causing an outbreak of such character.

2. The water supply as obtained from the filtration galleries is thoroughly susceptible to purification from whatever bacterial disease-producing organisms it may contain by the proper use of hypochlorite of lime; and when it is assured that the whole supply is being properly treated at all times with hypochlorite the water may be used, certainly with reasonable safety, for drinking and other domestic purposes without boiling previous to such use.

3. The milk supply and the general food supply of the city can be definitely eliminated as the chief and primary source of the infection which caused the recent outbreak, but it is readily conceivable, in view of the way in which much of the milk in the city is handled, that cans and bottles and consequently the milk itself were exposed to whatever infection was in the water or upon the hands of persons working in public dairies; and, therefore, milk may have operated to some extent as a secondary factor. Milk and other food supplies of the city, as handled at present, are liable at anytime in the future to be important sources of infection and therefore should be made subject to official inspection as soon as practicable.

4. Most of the privy vaults and privies in the city are of very faulty construction and constitute a menace to the health of the city in respect not only to typhoid fever but to all other diseases caused by organisms disseminated from faultily disposed of human excrement. The danger from these faulty privies will be greatest during the summer weather when flies and other insects are abundant.

The recommendations made by Dr. Lumsden in his report were as follows:

1. Safeguard the city's water supply. To accomplish this the following measures are suggested:

(*a*) Protection of the Raccoon River on both sides from sewage pollution at points upstream from the location of the filtration galleries as far as Valley Junction certainly and as much farther upstream as practicable. The Des Moines sewers could be extended to receive the sewage from Valley Junction, or the sewage from Valley Junction could be subjected to purification before being discharged into the river. The dumping of night soil from the privies of Valley Junction at places where it will be liable to seep or be washed into the river should be prohibited. Special attention should be given to surface drainage toward the river from privies at settlements located to the south (the right bank) of the river and within 5 or 6 miles up country from the filtration galleries.

(*b*) The abandonment as soon as practicable of the filtration galleries which cross under the river, and their replacement with closed conduits, so that the whole water supply will be received from the sand basin to the south side (right bank) of the river.

(*c*) Until the above changes, *a* and *b*, have been effected, and until the safety of the water as then delivered has been determined by prolonged and careful bacteriological and chemical studies conducted by competent and officially appointed investigators, the whole water supply should be treated constantly and under official supervision with hypochlorite of lime applied in accordance with methods approved by unbiased expert opinion.

(*d*) Until definitely and officially assured that the water has been made safe by the use of hypochlorite of lime the people should be advised to boil the city water before using it for drinking purposes.

The enactment of an ordinance requiring that all water sold in the city of Des Moines shall be within certain chemical and bacteriological standards of purity is suggested.

2. Use every effort to secure legislation which will require the prompt reporting of all cases of typhoid fever in the State of Iowa. This is urgently and immediately important. Without such law outbreaks due to readily removable causes may go on in different communities for some time before being discovered, and so cause much needless and preventable suffering and loss of life.

3. Secure official inspection of dairies and dairy farms and of other places where public food supplies are sold or prepared for sale. The enactment of an ordinance requiring the pasteurization of milk and sterilization of all milk cans and bottles under official supervision is suggested.

4. Abolish all faulty privy vaults and surface privies and replace them with privies provided with water-tight vessels for receiving the excrement, and constructed so that flies and other insects will not have access to the excrement.

5. Have all cases of typhoid fever investigated and the precautionary measures to prevent spread of infection from the besides of patients officially supervised by the local health officer.

INVESTIGATION OF AN OUTBREAK OF TYPHOID FEVER AT ELIZABETH, N. J.

Reports of an unusually severe epidemic of typhoid fever at Elizabeth, N. J., having appeared in the public prints during the latter part of September, 1910, it was deemed advisable to have this outbreak investigated, as the presence of cholera in Europe, and the proximity of Elizabeth to New York, made it possible, although not probable, that a "bacillus carrier" might have carried the disease to New Jersey. Passed Asst. Surg. W. C. Rucker was therefore sent to Elizabeth on September 28, with instructions to determine the origin of the infection, and also to secure specimens for examination at the Hygienic Laboratory, so that the possibility of a cholera outbreak might be excluded.

Passed Asst. Surg. Rucker found on his arrival that the outbreak had been carefully investigated by the local health officer, and he therefore had very little trouble in obtaining an abundant supply of data, a great part of which was subsequently checked by himself.

The facts ascertained were the following:

Elizabeth, N. J., has an estimated population of 80,000 inhabitants. The total number of deaths from typhoid fever since January 1, 1910, had been 6. During the year 35 cases of typhoid fever had been reported, 13 of which had occurred during the September outbreak. On September 7 a social organization in the city had a gathering for the purpose of presenting a newly appointed policeman with the complete outfit of his profession. About 75 men attended the meeting. Of these, 14 had already been stricken with a typhoidlike disease; 3 of the 14 had died, and one was in a very critical condition. Among the dishes served at the celebration was a lobster salad, and it was shown that only those persons who partook of this dish were taken sick. The disease was most severe among those who sat at the head table, all of them having eaten freely of the salad. Those persons who ate nothing at all at the dinner, or who did not eat the salad, remained well.

After a careful review of all the evidence, and considering the symptomatology of the cases personally observed by him, and the fact that in several instances positive Widal reactions were obtained, the investigator came to the conclusion that the outbreak occurring at Elizabeth was one of typhoid fever, of extreme virulence, and that the disease had been transmitted to the patients through the lobster salad.

Examination at the Hygienic Laboratory of the specimens secured by Passed Asst. Surg. Rucker confirmed his preliminary diagnosis, and finally eliminated from consideration the possibilty of a cholera outbreak at Elizabeth.

INVESTIGATIONS INTO THE WATER SUPPLY OF HUNTSVILLE, ALA., WITH SPECIAL REFERENCE TO THE OCCURRENCE OF TYPHOID FEVER.

On request of the Member of Congress, the city authorities, and the Business Men's Club, Passed Asst. Surg. L. L. Lumsden was on October 7, 1910, sent to Huntsville, Ala., with instructions to make an investigation of insanitary conditions with special reference to water supply in relation to the occurrence of typhoid fever. Suspicion had been cast on the water supply of the city by chemical examination previously made, and the State health officer of Alabama had previously had a report from his bacteriologist and pathologist to the effect that not only was the local water supply polluted, but the general sanitary conditions in the city were bad.

As is the policy in such instances, the investigation was undertaken in cooperation with the State health officer. On arrival in Huntsville on October 13, Dr. Lumsden held a conference with a number of citizens interested in the situation. The prevalence of typhoid fever, the character of the water supply, and the general sanitary condition of the city were discussed. There appeared to be a unanimity of opinion that it was highly desirable to have a thorough investigation made so that faulty conditions might be definitely determined and corrective measures instituted. Accompanied by the mayor, Dr. Lumsden made an inspection of Big Spring, which is the principal water supply of the city and its surroundings, and then proceeded to make a sanitary survey of the city and its environs in order to get a comprehensive view of the situation.

Dr. E. M. Mason, the bacteriologist and pathologist of the State board of health, having arrived in Huntsville on the evening of October 14, joined in the work on behalf of the State health officer. The sanitary survey was taken up in detail, and particular effort was made to determine the liable sources of dangerous contamination of the water entering the Big Spring. Dr. Lumsden's report of the investigations is in part as follows:

TOPOGRAPHY.

Huntsville is located on the foothills, to the west of Monte Sano, a range of the Alleghanies. Mountains rise in striking scenic beauty to the north, east, and south of and at distances varying from about 2 to 6 miles from the city. A spur of Monte Sano projects in between the main range and the city and is known as the "Little Mountain." The top of this little mountain is about a mile and a half from the center of the city. Thus the gently rolling hills on which the city is built lie within a kind of broad basin which opens to the west. Between the mountains to the east and the city there are no surface streams, and the water colleced by the extensive shed of hills and mountains flows underground. The land on which the city is built and to the north, east, and south of the city, as far as the mountains, is generally of limestone formation. In certain places there are varying depths, but none considerable, of freestone soil superficial to the limestone, but in many places—and in the city limits particularly—the limestone stratum comes to the surface of the ground. The limestone stratum is extensively fissured. The crevices extend from the surface to considerable depths, so that surface drainage may be carried, more or less directly, to streams of water flowing through the deeper parts of the stratum. It is easy to understand that in such a formation the soil is almost entirely lacking in filtering qualities, and therefore the fact that water comes from considerable depths underground gives no assurance whatever that such water is reasonably free from dangerous surface contamination.

POPULATION.

The population of Huntsville in 1909, according to the official estimate of the United States Census Bureau, was 7,649. There are a number of villages in the vicinity of the municipality, so that within a radius of 3 miles from the center of the city there is a population, according to local estimate, of about 14,000. Of the population within the city limits, nearly 50 per cent are colored.

WATER SUPPLY.

The public water supply is obtained from a spring, known as the "Big Spring of Huntsville," located at the southwestern edge of the city and downhill from the greater part of the city. Over 90 per cent of the water used in the city is obtained from this spring. The remainder is obtained from a few smaller springs and from wells, all of the latter being located on private property. The Big Spring appears to be an outlet for a large underground stream, which runs from a northeasterly direction through and under the city. It is surmised, and, so far as can be judged from surface indications apparently with reason, that this stream has its source in the mountain about 4 miles distant from the spring and probably receives numerous tributaries and sends off branches along its course. Several years ago it was determined by thoroughly competent observers that there was communication between the spring stream and a well (at the Butler School) located about one-half mile northeast from the spring. I was informed by those who conducted the experiment that a short while after putting 2 or 3 pounds of permanganate of potassium in this well the stained water appeared in the spring. This well had been filled up sometime before the time of my investigation, so that I was unable to repeat the experiment. Several open wells in the city, which were suspected to communicate with the spring, I tested with either permanganate of potassium or fluorescein, but with negative results.

The flow of water through the spring is estimated at 1,000,000 gallons per hour. About 3,000,000 gallons daily are supplied the city. The water is pumped directly to the distributing mains, the pressure being regulated by a standpipe.

The basin of the spring is about 40 feet in diameter and is walled in on its east and south sides by a natural cliff of limestone, which rises to a height of about 35 feet, and on its north side by stone masonry. The basin is not adequately protected from surface drainage from its immediate surroundings and several of the waste pipes connected with a large office building, located on the steep ridge immediately over and not more than 50 feet from the north side of the spring basin, had evident leaks. The conduit for the water supply leads from a well sunk in the ground on the outer surface of the wall to the north side of the basin. The water is admitted to the well by a gate fixed in the wall of the spring basin and which can be opened and closed as desired. This well is protected from surface drainage even less than is the spring basin. The current of water enters the spring basin through a crevice in the limestone cliff. The crevice is about 3 feet in width, is open to the surface of the cliff—about 35 feet above—and extends upstream for a distance of about 20 feet from the face of the cliff. At that point the crevice is arched over by the limestone and so converted into a cavern whose roof is about 10 feet above the surface of the water. The length of the cavern is about 20 feet and the current of water as it enters the cavern from under the limestone wall has a swift rate of flow.

To the casual observer this spring with its abundant supply of clear, cool water gushing out at the foot of the limestone hill is very impressive, and it is easy to understand the pride which citizens of Huntsville for years had in their "Big Spring." But when the location of the spring, the surface pollution of the soil above and around the spring, and the lack of filtering qualities of the soil are carefully considered serious misgivings as to the purity of the water will arise. Such misgivings did arise in the minds of some of the citizens and some months ago samples of water from the "Big Spring" were sent for analysis to the Bureau of Chemistry, United States Department of Agriculture. The report was returned that the water showed evidence of pollution. Later on, samples were sent for bacteriological analysis to the laboratory of the Alabama State board of health and again the report returned was that the water showed evidence of pollution.

I made bacteriological examinations of samples of the water taken as follows:

(1) From the current just as it enters the underground cavern above the spring basin. The water at this point is not exposed to dust and drainage from the ground surface immediately around the spring basin as is the water in the spring basin and in the crevice between the cavern and the basin.

(2) From the intake—this representing the water after it has traversed the cavern, the open crevice, the spring basin, and the gate leading through the wall between the basin and the intake well and as it enters the conduit for distribution to the city.

(3) From a tap in the central part of the city—after the tap had been allowed to flow for at least 15 minutes.

All of the samples were collected by myself and extreme aseptic precautions exercised to prevent accidental contamination of the samples. The samples were planted immediately after collection. The results of the examinations are presented in the following table:

Date of examination.	Samples of water from—	Number of bacteria per cubic centimeter as shown by colonies on agar plates incubated at about 37° C. for 48 hours.	Fermentation with gas formation in lactose bouillon obtained from—						Colon bacillus in—		
			1 cubic centimeter.				5 cubic centimeters.		1 cubic centimeter.		5 cubic centimeters.
			a		b				a	b	
			24 hours.	48 hours.	24 hours.	48 hours.	24 hours.	48 hours.			
Oct. 17, 1910	Water as it entered cavern above basin of spring	240	+	+	+	+	+	+	+	?	+
Oct. 18, 1910	Influent to spring basin	180	+	+	+	+	+	+	+	?	+
Oct. 17, 1910	Intake well	160	+	+	+	+	+	+	+	?	+
Oct. 18, 1910	do	100	+	+	—	—	+	+	+	—	+
Oct. 17, 1910	Tap	220	+	+	+	+	+	+	+	?	+
Oct. 18, 1910	do	970	+	+	+	+	+	+	+	?	+

It is evident from these results that the water has a high colon bacillus content. Of 12 samples taken from different parts of the water system and examined in quantities as small as 1 cubic centimeter, all except one responded positively to the presumptive test for the colon bacillus—all the samples responding positively to the presumptive test and which were examined further were found to contain colon bacilli. The total bacterial content of the water, as shown by growth on agar plates at 37° C., was somewhat surprisingly low—gelatin plates at 20° C. for such water, as a rule, give much higher counts than do agar plates at 37° C. The relatively high content of colon bacilli in the water when considered in connection with the total bacterial content is of especial significance, in that it indicates a high degree of pollution with feces.

The presence of colon bacilli in a water, when taken as a single datum, does not prove that the water is polluted with excrement from human beings, because these organisms exist in the feces of horses, cattle, and other lower animals, and colon bacilli from feces of lower animals are, by present bacteriological methods, entirely indistinguishable from those found in the feces of man.

The results of the sanitary survey of the watershed of the spring, however, left no room for reasonable doubt that at practically all points from which excrement from lower animals could gain access to the water excrement from persons also could enter. Therefore, coupled with the results of the sanitary survey, the presence of colon bacilli in the water to the extent demonstrated is, in my opinion, sufficiently positive evidence that the water of the Huntsville Big Spring is polluted with human excrement and for that reason is to be condemned as unsafe for use as a drinking water and for other domestic purposes.

GENERAL SANITARY CONDITIONS.

Huntsville has a water-carriage sewerage system with which about 50 per cent of the houses in the city are connected. Practically all of the houses not connected with the sewerage system have surface privies, and at many houses connected with the sewerage system surface privies are maintained in back yards for use of servants.

These surface privies are of very faulty construction and, as now used, constitute, in my opinion, by far the gravest single menace to the public health of the community. The dejecta go directly on the ground, and domestic animals—such as chickens, dogs, cats, hogs, etc.—which chance to be on the premises have ready access to the privy contents. In some instances chickens were apparently depended upon to keep the ground under the privy "clean." Drainage from the privy contents readily seeps into the porous soil and from many places, beyond reasonable doubt, finds its way to the water supply.

Cattle, horses, and hogs are kept on a number of premises within the city, and in the carelessly-kept manure heaps flies find ample breeding grounds. Comparatively few houses in the city are screened. There is no system of sanitary inspection, food inspection, or milk inspection. Cases of typhoid fever and of other diseases caused by excrement-borne infections are not reported, and there is no official supervision over them, so that the carrying out of precautionary measures to prevent spread of infection from such cases rests entirely with attending physicians and families of the cases.

PREVALENCE OF TYPHOID FEVER.

As cases of typhoid fever are not reported, the prevalence of the disease can be estimated only from the deaths recorded. No record of deaths occurring prior to January 1, 1909, could be found. The number of deaths from typhoid fever reported from January 1, 1909, to October 1, 1910, was as follows:

	1909	1910		1909	1910
January	0	1	July	2	0
February	1	0	August	2	6
March	1	0	September	3	2
April	0	0	October	1	....
May	1	1	November	0	....
June	1	2	December	0	....
				12	....

This list does not include deaths which occurred in the surrounding villages, but only those which occurred in the municipality of Huntsville. The local physicians and the citizens generally are under the impression that typhoid fever has not been unusually prevalent in Huntsville during the last two years; in fact, that in 1909 the disease was somewhat less prevalent than usual. Fifteen deaths a year for the last several years, I believe, after considering all the data available, to be a conservative estimate. This number of deaths in a population of about 8,000 gives Huntsville an annual typhoid fever death rate of about 187 per 100,000 population as compared with a rate of 93.6 for the State of Alabama and of 46.5 for the United States during the census year 1900. Thus it appears that Huntsville has an excessively high typhoid rate, which must be due largely to local conditions. Some of the physicians in Huntsville express the opinion that a considerable proportion of the deaths reported from typhoid are really deaths from malarial fever, but after discussing this matter with practically all of the local physicians and after carefully considering all the features of the situation—the comparatively small number of mosquitoes in the city and its immediate vicinity being especially noted—I am strongly inclined to believe that in Huntsville the proportion of deaths from typhoid reported as deaths from malarial fever is considerably larger than the proportion of deaths from malarial fever reported as deaths from typhoid.

In the course of a discussion of this point at a conference with the local physicians, on the evening of October 15, Dr. Mason urged the physicians to send specimens of blood from their cases to the State board of health laboratory, for examination for both malaria and typhoid. Therefore, the physicians of Huntsville now have laboratory methods readily available to assist them in the accurate determination of the relative prevalences of the two fevers in their city.

CONCLUSIONS.

1. *The water supplied by the Big Spring of Huntsville is dangerously polluted with human excrement.*—The public spring to the south of the Big Spring and the majority of the private wells in the city are exposed, more or less, to similar pollution.

2. *The excessively high rate of prevalence of typhoid fever in Huntsville is due largely to local insanitary conditions.*—Of these conditions the faulty disposal of excreta from persons is chief and primary. From the contents of the numerous surface privies the germs of typhoid and of other excrement-borne diseases may be conveyed readily and either directly or indirectly to foods and beverages. Seepage, dust, flies and other insects, persons, chickens, dogs, cats, hogs, etc., being possibly operative factors in such conveyance.

3. In view of the insanitary conditions and the evidence that many media besides water are operative in the transmission of the infection, the securing of an absolutely pure or purified public water supply, as a single preventive measure, would probably be followed by a considerable reduction in the typhoid fever rate, but could not reasonably be expected to reduce the rate to satisfactorily low figures. On the other hand, the connecting of every house in the city and in the immediate suburbs with a water-carriage sewerage system could not be depended upon to safeguard the present water supply against infection, because, through such leaks as will occur at times in sewers of the best practicable sewerage systems, sewage would be liable to find its way into the water of the Big Spring as this spring is now located.

Therefore, to reduce satisfactorily the typhoid rate in Huntsville, the two general measures most urgently needed are (1) an improvement in methods of disposal of excreta from persons and (2) the obtainment of a public water supply free from dangerous pollution.

RECOMMENDATIONS.

1. *The abolition of all surface privies and their replacement either by sanitary water-closets connected with the water-carriage sewerage system or by sanitary privies.*—A step suggested for the accomplishment of this is the enactment of an ordinance requiring that within a given period—say 90 days—from the date of passage of the ordinance, all residences be provided with either sanitary water-closets or sanitary privies, and that each and every residence not so provided be condemned as unfit for human habitation. If for any reason it should not be desired to impose the expense of construction and maintenance of sanitary privies upon individual occupants or owners of properties, such expense might be met by a privy tax levied upon all the property

in the municipality. Such taxation certainly would not be entirely without equity, inasmuch as the sanitation of the private properties would be for the protection of the whole community and, therefore, somewhat alike in principle to the building of fortifications upon private properties in time of war.

All possible steps should be taken to have the sanitary measures carried out in Huntsville applied in Dallas. This cotton-mill town, though politically a separate corporation, is geographically continuous with Huntsville, and the use of insanitary privies in Dallas is a menace to the health of the people of Huntsville. The double-pail system[1] of sanitary privies is recommended for use in the nonsewered sections of Huntsville and vicinity.

The management of the privy should be officially supervised. The disposal of night soil in septic tanks connected with the water-carriage sewerage system is suggested.

2. The obtainment of a pure or a purified public water supply.

To accomplish this the following plans are suggested:

(*a*) The sinking of shafts at points, where the indications for water are good, east of the city and above probable sources of surface pollution. If water in desirable quantity and of desirable quality can be obtained from wells sunk from the top of the "Little Mountain," the present problem of finding a water supply for Huntsville may be solved in a most satisfactory way.

(*b*) The treatment of the water from the Big Spring with hypochlorite of calcium, by what is now frequently referred to as the Leal process. The results of the bacteriological studies suggest that this water is particularly suitable for treatment with hypochlorite. As compared with other purification processes the hypochlorite process seems to present for this water supply the advantages of cheapness and rapidity of installation, smaller cost of maintenance and probably equal, or even greater, efficiency.

If purification of the Big Spring water is decided upon, I should advise the determination experimentally of the applicability of the hypochlorite process to this water, certainly before any of the more expensive purification processes such as filtration are provided for.

(*c*) The use of water from Brahan Spring. This spring is located about a mile and a half to the southwest of Huntsville. It is now used as a source of water supply for the Merrimac Cotton Mills and the town of Merrimac. There appears to be no doubt that its supply of water is ample for Huntsville. The drainage shed of this spring is to the north and west and is distinct from that of the Big Spring of Huntsville. So far as could be determined, the soil of the drainage shed for several miles above this spring has a superficial stratum of over 30 feet in depth generally, which appears to possess good filtering qualities. The drainage shed is now sparsely settled, so that there are few sources of possible contamination from human excreta. At the time of the inspection, a number of cattle were grazing around the spring and it was obvious that manure could be readily carried into the water of the spring through surface drainage and dust.

The results of the bacteriological examination of samples of water from the spring and from a tap at the Merrimac mills were as follows:

Date of examination.	Sample from—	Bacteria per cubic centimeter as shown by colonies on agar plates incubated at about 37° C. for 48 hours.	Fermentation with gas formation in lactose-bouillon obtained from—				Colon bacillus in—	
			1 cubic centimeter in—		5 cubic centimeters in—			
			24 hours.	48 hours.	24 hours.	48 hours.	1 cubic centimeter.	5 cubic centimeters.
Sept. 19, 1910	Spring	200	−	+	−	−	+	−
Do	Tap	380	−	Bubble.	+	+	−	+

Considered in connection with the results of the sanitary survey, the presence of colon bacilli in this water to the extent found has but little sanitary significance, and the indications are that if this spring were provided with a cement basin, so that contamination from surface drainage from the immediate surroundings would be prevented, its water would be reasonably safe and wholesome.

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[1] The privy described in an article published in the November 11 issue of Public Health Reports may prove to have advantages over the double-pail privy.

Pending the obtainment of a pure or a purified water supply, the citizens of Huntsville can not be too strongly urged to boil, previous to use for drinking, all water obtained from the Big Spring and other surface supplies in Huntsville.

3. *The creation of position of city health officer, carrying with it an adequate salary, so that efficient services could be demanded.*—The health officer in conducting inspections of foods and of general sanitary conditions, in reasonably supervising precautionary measures to prevent the spread of infection from cases of infectious diseases, and in many other ways which naturally would occur to him as his work developed, could certainly render services whose value to the community would be many times over the amount of his salary.

4. *The enactment of an ordinance requiring the prompt report to the health office of all cases recognized as, or suspected to be, cases of typhoid fever, or of other infectious and contagious disease, so that proper precautionary measures at the bedsides of patients could be begun early.*—The registration of births and deaths is very important, because without vital statistics the results of sanitary work can not be known.

Huntsville as a city possesses many natural advantages, and there appears every reason to believe that by having carried out reasonable and now obviously needed sanitary measures it may become one of the most healthful cities in the country, and have a typhoid fever rate so low that the figures could be used advantageously in business advertisements.

Copies of Dr. Lumsden's report were furnished to the State health officer, and to others interested, and the facts contained therein were in entire accord with the findings of the State health authorities.

INVESTIGATION OF TYPHOID FEVER IN YAKIMA COUNTY, WASH.

For some years typhoid fever has been highly prevalent in Yakima County, Wash. In North Yakima, the largest town and county seat, the average annual death rate from this disease for the three years 1908–10 was about 180 per 100,000 of population. In May–June, 1911, an explosive outbreak of typhoid fever occurred in North Yakima. Fifty-five cases developed in the course of five or six weeks. In the several previous years the season of high prevalence of the disease had been the summer and fall, and, as a rule, there had been very little typhoid in the city during the winter and spring seasons. The outbreak served to arouse the people generally to a realization of the seriousness of their typhoid fever situation. At the request of the city, county, and State authorities, Passed Asst. Surg. L. L. Lumsden was sent to North Yakima to investigate typhoid fever in that city and vicinity. His studies comprised practically all sections of that county, and were made with a view to determining the causes of the prevalence of the disease and the measures necessary for its prevention. All expenses incidental to the investigation were paid by the city and county. The investigation was begun on June 17 and completed on July 23.

Upon the completion of the investigation, Dr. Lumsden made to the commissioners of the county and to the mayor and council of the city, a preliminary report presenting definite conclusions and specific recommendations. In fact, throughout the investigation certain measures were recommended from time to time. As a result of carrying out the measures advised, the rate of prevalence of typhoid fever in North Yakima was reduced to less than one-tenth of the rate for the summer and fall season of any one of the several previous years. The results accomplished by the local authorities appear to represent one of the most brilliant achievements in municipal sanitation in recent years. Dr. Lumsden's complete report is being published as Public Health Bulletin No. 51. The part of the report dealing with the situation in North Yakima will contain the following conclusions and recommendations:

CONCLUSIONS.

1. The high rate of prevalence of typhoid fever in North Yakima in the summer and fall of the years 1908, 1909, and 1910 was due for the most part to the local dissemination of human excreta from insanitary privies, privy vaults, cesspools, septic tanks, and bedsides of the sick to the mouths of persons by fingers, flies, foods, and water.
2. Exogenous infection introduced into the city through the public water supply, milk supply, and fruit and vegetable supply very probably has contributed from time to time to the prevalence of the disease, but the high rate of prevalence of typhoid fever in North Yakima year after year has been caused chiefly by infection of distinctly endogenous character.
3. The outbreak of typhoid fever in North Yakima in May–June, 1911, was caused, beyond reasonable doubt, by infection in water pumped, either wilfully or by accident, from the Cascade Lumber Co.'s mill pond into the city water mains.
4. The prevalence of typhoid fever in North Yakima for the summer and early fall of 1911 was reduced by about 90 per cent, as compared with the rate for the corresponding periods in previous years, by the carrying out of reasonable measures directed especially toward the correction of insanitary local conditions.
5. The results of the campaign against typhoid fever in North Yakima in the summer of 1911 are striking and indicate that the high annual prevalence of typhoid fever in the towns and rural districts generally of Yakima County is amenable to very marked reduction by the application of simple measures for the correction of insanitary local conditions.

RECOMMENDATIONS.

1. Extend the public water system and the water-carriage sewerage system as rapidly as possible to reach all sections of the city.
2. Rigidly enforce laws and regulations requiring every habitation within the publicly sewered and watered areas to be properly connected with the sewerage system.
3. Abolish every insanitary privy, privy vault, cesspool, and septic tank in the city and replace those in the nonsewered areas with sanitary privies.
4. Exercise rigid official supervision over all privies to make sure that they are maintained at all times in sanitary condition.
5. Provide a municipal service for the proper disposal of privy contents.
6. Enact an ordinance prohibiting the occupancy of any new or any vacated building until after a permit to occupy has been granted

by the health department, the health department to issue such permit only after due inspection and determination that the prospective residence is provided with proper sanitary devices.

7. Rigidly enforce ordinances prohibiting the maintenance on premises of such nuisances as collections of stable manure and garbage not kept in fly-proof containers.

8. Make every day clean-up day for all streets, alleys, and back yards in the city.

9. Have exercised under official supervision at the bedsides of all patients suffering from or suspected to be suffering from typhoid fever rigid precautionary measures to prevent spread of the infection.

10. Safeguard the public water supply by the following measures:

(*a*) Sanitary patrol of the watershed to prevent pollution of the water with human excreta.

(*b*) A change of location of the intake so that the water will be received from the river at a point upstream from the Tieton River.

(*c*) An extension of the closed conduit so that the water will be protected from pollution throughout its course from the river to the mains in the city.

(*d*) Replacement of the old reservoir on Nob Hill, if there be need for a reservoir, with a reservoir constructed either of cement or of other material impervious to water.

11. Pass and strictly enforce an ordinance requiring the purification of the public water supply to such a degree that the water will not contain at any time more than 100 bacteria to the cubic centimeter nor an average for 10 days of more than 1 colon bacillus to 200 cubic centimeters.

The measures for purifying the water suggested for consideration are:

(*a*) Adequate treatment with hypochlorite of lime.

(*b*) Filtration.

12. Enact an ordinance prohibiting the sale or the offering for sale in the city of any water which may be shown by bacteriological examination not to be within the standard of purity defined in recommendation 11 for the public water supply.

13. Abolish the shallow wells in the city as rapidly as the extension of the public water supply makes it practicable, and in the meanwhile, prevent, so far as practicable, the use of water from dangerously polluted wells or springs.

14. Rigidly enforce the ordinance passed in May of 1911 for the safeguarding of the milk supply.

15. Enact an ordinance prohibiting the sale or the offering for sale in the city of any milk or green garden truck obtained from farms not provided with either sanitary privies or sanitary water closets.

16. Enforce as rigidly as is practicable, measures directed toward the prevention of contamination of any foods or beverages whatsoever in North Yakima by fingers or flies soiled with human excreta.

17. Maintain the strength of the health department so that the city government can perform with reasonable adequacy its duty for the preservation of the health and lives of the people of North Yakima.

INVESTIGATION OF AN OUTBREAK OF TYPHOID FEVER IN LITTLE ROCK, ARK.

Typhoid fever was unusually prevalent in the city of Little Rock, Ark., during the summer of 1911, the total number of cases reported from June 1 to August 15 being 321. In response to a request from the local authorities and the Governor of the State, Passed Asst. Surg. W. H. Frost, of the service, was detailed on July 13 to conduct an investigation into the origin and prevalence of typhoid fever in that city and to suggest remedies for the eradication and control of the disease.

The investigations were continued until September 6, 1911, and included:

1. The collection and verification of all reports of cases of typhoid fever.
2. A sanitary survey of the city, with special reference to preventive measures used at the bedsides of patients; sewage disposal in the vicinity of patients, and the facility of spread of the infection by means of flies.
3. A study of the water supply from a sanitary standpoint.
4. A survey of as many dairies as possible, to estimate the chance of contamination from this source.

Due consideration was also given to numerous other factors less directly concerned in the spread of typhoid fever, such as garbage disposal, with its bearing on the breeding of flies; methods of handling and distributing green groceries; manufacture and distribution of ice cream, etc. In addition, personal investigation was made of a majority of the typhoid fever cases reported.

One of the most important facts brought out by the investigation was the surprisingly large number of cases (41.6 per cent) attributable to infection by contact with previous cases. A notable feature also was the frequency of occurrence of more than one case in a house. Among 202 cases investigated, 87, or approximately 42 per cent, occurred in houses in which more than 1 case occurred.

A study of the available data pointed to one of the largest dairies in town as having played a decisive rôle in the spread of the epidemic, especially during the month of June, when the disease reached its height.

After studying all the data assembled, the conclusion was that the infection was in all probability originated by infection of milk and spread largely by contact.

Passed Asst. Surg. Frost presented a report to the mayor and city council, and a full report will subsequently be published. His recommendations were, in effect, as follows:

IMPROVEMENT OF THE WATER SUPPLY.

First. An increase in the capacity of the sedimentation basin or the addition of a second sedimentation basin.

Second. The water should be kept free at all times from disagreeable odors by frequent cleaning of the basin, or better still, by covering the filtered water reservoir in such manner as to exclude the sunlight and prevent the growth of vegetable organisms.

Third. The plant should be provided with an apparatus for the addition of hypochlorite of lime to the filtered water when necessary.

Fourth. The operation of the filtration plant should be under the constant supervision of a thoroughly competent person.

Fifth. A continued study of the bacteriology of the water, to give an idea of the usual quality of the water and to serve as a check on the efficiency of the filters.

PROTECTION OF THE MILK SUPPLY.

It was recommended that all dairies supplying milk to the city should be under strict supervision, and that the object should be to educate the dairymen in the methods of producing clean milk, and to encourage rather than to discourage them. The most effective way of eliminating the danger of typhoid being introduced through the milk supply was stated to be efficient pasteurization of the milk, and the encouragement of pasteurization plants in the city was especially recommended.

GENERAL RECOMMENDATIONS.

It was recommended also that special attention should be paid to preventive measures carried out at the bedside of patients, and, in order that the Health Department might be enabled to have proper supervision over this bedside prophylaxis, there should be prompt reports of all cases occurring in the city.

To encourage prompt and early reporting, it was urged that facilities should be offered by the Health Department for the diagnosis of cases.

Special attention was placed on sewage disposal, the making of connections with the present sewer system, or provision for dry closets.

Ordinances regulating the handling of green groceries and requiring all restaurants to be maintained in sanitary condition were also recommended.

Finally, it was urged that there should be intelligent cooperation of the public, and that in order to carry out the recommendations made, the organization and equipment of an adequate health department was necessary.

INVESTIGATIONS OF TYPHOID FEVER IN FORT SMITH, ARK.

In accordance with the desires of the local health authorities and by request of the governor of the State, there was undertaken an investigation into the origin and prevalence of typhoid fever at Fort Smith, Ark. Passed Asst. Surg. W. H. Frost, who had made like studies at Little Rock, began the investigations September 5, and continued his studies until September 30.

In order to ascertain the prevalence of typhoid fever in the city, the local health officer sent out a circular letter requesting an immediate report of all cases of the disease treated since June 1. By this means, and through other sources, it was determined that a total of 71 cases had occurred. A comparison of the annual death records from 1901 to 1910 showed that the prevalence of typhoid fever in Fort Smith during the present year had not been unusual, but compared with other cities, the rate of 58.3 per 100,000 for Fort Smith in 1910 was much higher than many southern cities. Dr. Frost estimates that probably not less than 100 cases of typhoid fever occur annually in Fort Smith, which are certainly excessive and demand careful consideration.

Since typhoid fever is carried in different ways, a personal investigation of 28 cases was made to determine the means of transmission operating in the city. In studying these cases, attention was paid to the possibility of the infection being conveyed by direct contact, bacillus carriers, food, flies, or water, or whether insanitary conditions of premises were a possible factor.

There was no evidence that infected milk had played any recognizable part in causing typhoid fever in Fort Smith during the present year, and the city water supply could hardly be considered as a probable source of infection for the cases investigated. From a careful analysis of the cases of typhoid fever investigated and a survey of sanitary conditions, Dr. Frost was of the opinion that the prevalence of typhoid fever during the present summer and fall was due chiefly to the spread of infection through open privies and defective water-closets and to the lack of efficient precautions in the care of recognized cases of the disease.

A careful study was made of the source and character of the water supplied to the city. From this it was evident that the water supply was polluted, and recommendations were made that would lead to its purification. Recommendations were also made with respect to the milk supply, the disposal of sewage, the collection of statistics, and the organization and administration of the health department for the control of typhoid fever and the improvement of sanitary conditions generally.

The report of this investigation was published in the Public Health Reports, October 27, 1911.

INVESTIGATIONS OF TYPHOID FEVER IN THE DISTRICT OF COLUMBIA; FOURTH REPORT.

In the annual report for 1910, page 17, reference was made to investigations of typhoid fever in the District of Columbia by a board of officers appointed for that purpose in July, 1906. The studies of the board were practically continuous from July 2, 1906, to January 1, 1911. Four reports on the findings of the board have been published as Hygienic Laboratory Bulletins Nos. 35, 44, 52, and 78. The fourth report presents the results of the special studies made in 1909 and of the general observations on the situation made in 1910. The conclusions drawn and the recommendations made by the board in its final report were based on the results of the studies for the whole period of five years.

In the annual report for 1909, page 42, there appears a summary of the first three years studies of the typhoid fever board. It remains to summarize briefly the conclusions based on the entire investigation.

From 10 to 15 per cent of the cases reported as typhoid fever were not typhoid, and the majority of the reported cases were not reported until the patients had been sick and attended by physicians for more than 10 days. About 24 per cent of the cases reported during 1906 to 1909 contracted the infection away from the District.

Typhoid fever is disproportionately high among the negro race during the warm months of the year and the high case fatality rate among them accounts to some extent for the comparatively high typhoid fever death rate in Washington. The disease is more prevalent among males than among females. The disease is especially prevalent among children, suggesting milk and personal contact as factors in the distribution of the infection.

The disease is endemic in Washington, and during the four years there was a general and fairly uniform distribution of cases throughout the District.

There has been a marked reduction in the rate of prevalence of typhoid fever in Washington since 1906. In 1910 the morbidity rate and the mortality rate for typhoid were lower than in any previous year of which there is record.

There is a higher prevalence of typhoid fever in Washington during the summer season, and in 1909 the rate of prevalence among persons living in alleys was disproportionately high during the warm weather months.

In each of the four years, the majority of the cases were from among persons living in houses of good or fairly good sanitary condition. There is no striking difference in the prevalence of the disease in the sewered and in the nonsewered districts, and the public water supply since the autumn of 1906 has, in the opinion of the board, played little if any part in the causation of typhoid fever in Washington. Milk was determined to be one of the major factors in the distribution of the disease in the District, but in 1909 the number of cases attributable to this cause was considerably smaller than in previous years.

Other factors, such as raw shellfish, raw vegetables and fruits, and flies are mentioned in relation to the prevalence of the disease, and personal contact is mentioned as one of the major factors in the spread of the infection.

Bacillus carriers are mentioned as an important agency, and wonder is expressed by the board why, on this account, the disease is not more prevalent than it is.

Finally, the board states that the carrying out of measures to prevent the spread of infection from the bedside are inefficient, and that a campaign within the city against typhoid fever as a communicable disease and the enforcement of reasonable measures to prevent the introduction of infection into the city from without would greatly reduce the amount of typhoid fever in the District.

A number of important recommendations were made by the board and may be found in the published report.

The investigations, though made with the special purpose of determining the causes of typhoid fever in the District of Columbia, have thrown much light on the causation of typhoid fever generally, and of urban typhoid fever particularly. The definite determination that typhoid fever may be generally distributed and highly prevalent in a large city without the water supply playing an important rôle in the distribution of the infection has helped very materially in the advance of the knowledge of typhoid fever epidemiology in America. It is gratifying to report that in a number of other cities in this country the local authorities within the last two or three years have been conducting studies of typhoid fever and in so doing have employed methods similar to those used in Washington by the board of service officers.

INVESTIGATION OF TYPHOID FEVER IN THE RURAL DISTRICTS OF VIRGINIA.

Upon the request of the commissioner of health of Virginia, Passed Asst. Surg. L. L. Lumsden was detailed to make an investigation of typhoid fever within that State, to determine the causes of the undue prevalence of the disease in rural districts, the methods of its transmission, and the measures necessary for its control in such localities. The investigation was begun on August 15 and continued until October 1. It was conducted cooperatively by Dr. Lumsden and by Dr. A. W. Freeman, the assistant commissioner of health of Virginia.

The investigation comprised an epidemiological study of cases to determine the conditions supposed to have any bearing on the causation of the disease to which the persons affected had been exposed prior to illness; microscopic tests to determine (*a*) the accuracy of diagnoses of reported cases, (*b*) the nature of the disease in suspected cases, and (*c*) the presence of human carriers of the infection; field inspection and bacteriological examination of water supplies; a careful study of sanitary conditions in respect particularly to the dissemination in the different neighborhoods of human excreta by flies, domestic animals, hands and feet of persons, water, milk, garden truck, and other agents.

It is being more and more appreciated that insanitary conditions in the rural districts vitally affect not only the people who live in the rural districts but also the people who live in cities supplied with foods derived from the rural districts. In recent years extensive studies of typhoid fever have been made in a number of American cities, but there have been made heretofore in the United States no very extensive studies of the great problem of rural typhoid. The investigation by Drs. Lumsden and Freeman, of a field of vast importance to the whole American Nation, appears to be particularly opportune. The report of their findings is to be published as a Hygienic Laboratory bulletin. It is expected that the studies will be still further pursued in the summer and fall of next year.

INVESTIGATION OF THE PREVALENCE OF TYPHOID FEVER AT CHARLESTOWN, W. VA.

In accordance with a request of the State and local boards of health, Asst. Surg. J. R. Ridlon was detailed to conduct investigations of typhoid fever in Charlestown, W. Va., and vicinity, with a view to determining the cause of the undue prevalence of the disease in that locality, the methods of transmission, and the measures necessary for its control. The investigations lasted from August 19 to September 13, 1911, and included a sanitary survey of the source of the town water system; a study of the general sanitary conditions of the city, including the milk supply, food supply, and sewage disposal; and an epidemiological study of 30 cases of the disease.

The data compiled showed that there had been an excessive rate of typhoid in Charlestown during the months of June, July, and August, 30 cases, with 2 deaths, having occurred among a population estimated at 4,000, the rate of occurrence thus being 1 case to every 135 inhabitants and the mortality rate 50 per 100,000. The case mortality rate, 6.6, was lower than the average, which is usually about 10.

In the absence of either mortality or morbidity records, it was impossible to make any comparisons between this year and previous years, although local physicians seemed inclined to believe that there had been little, if any, more typhoid fever in Charlestown this season than in preceding ones.

It was noteworthy that 50 per cent of the cases occurred among children under 15 years of age. The distribution was nearly equal according to sex, 16 patients being males and 14 females. Twenty-two cases occurred among the white population and 8 among the colored, 50 per cent of these 8 being probably contact cases. The distribution of cases between the city and surrounding country was about equal. Paratyphoid infection was present along with the typhoid infection, 2 cases showing positive agglutination for B. paratyphosus A, but not for B. typhosus. A number of Widal tests were made, and it is improbable that any errors in diagnosis were made. The distribution and grouping of the cases pointed strongly to the conclusion that contact and flies had been the most important factors in the spread of infection. Only 1 case was attributed to milk, but probably, in view of the age of the patients and the lack of supervision over the milk supply, this article of food played a more important part as the cause of sickness. Evidence was lacking to indicate that the public water supply had played more than a minor part in the causation of typhoid.

For the prevention of typhoid fever in Charlestown, Dr. Ridlon submitted specific recommendations to the local board of health, laying emphasis on the following:

1. Improvement of the water supply.
2. Improvement of methods for sewage disposal.
3. Adequate supervision of milk and food supplies.
4. Installation of sanitary methods in disposing of stable and household refuse.
5. More careful attention to disinfection in the cases of typhoid patients.

Dr. Ridlon's report has been published in the weekly Public Health Reports.

SANITARY SURVEY OF THE GREAT LAKES.

In previous reports reference has been made to the pollution of interstate bodies of water and to the necessity of its prevention. In the annual report of 1907, page 21, reference is made especially to the occurrence of typhoid fever on vessels on the Great Lakes and to the necessity of investigations to determine the relation between pollution of the Lakes and the incidence of typhoid fever not only among those engaged in interstate traffic but among the population living in the vicinity of the Great Lakes.

It has been estimated that the Great Lakes must in future be the source of water supplies of more than one-fourth of the population of the United States, and the natural bodies of water throughout the country generally must be depended upon more and more as the source of public water supplies. Notwithstanding this fact, little attention has been paid to preventing the pollution of streams, and no compiled data have been available to show the actual amount of sewage pollution of natural bodies of water and the effect of such pollution on the public health. Bills have been introduced in Congress with the above object, but have not been acted upon.

In the meantime, however, it was deemed necessary to secure as much information as possible on the subject. One means of doing so was to examine the precautions being taken by State and local authorities to prevent the spread of typhoid fever in interstate traffic, to extend the investigations of typhoid fever already being made by the service so as to include a determination of the prevalence of the disease in the region of the Great Lakes and its relation to the sewage pollution of those bodies of water.

In accordance with section 3 of the quarantine act of February 15, 1893, therefore, Passed Asst. Surg. A. J. McLaughlin was detailed December 17, 1910, to inquire into the precautions being taken to prevent the spread of typhoid fever and other water-borne infections in interstate traffic. His attention was called to reported outbreaks of typhoid fever and statistics of diarrheal diseases and the likelihood of such diseases being transported from one State to another. His instructions included the following points:

First. Analysis of all available data throwing light on the prevalence of typhoid fever and other water-borne diseases in cities and towns situated on the Great Lakes and comparison of these statistics with those of cities and towns not so situated.

Second. Compilation of facts by means of reports and consultations with State and municipal authorities to determine the amount of pollution of water supplies of cities using lake water, and the influence of such pollution on the prevalence of typhoid fever and other water-borne diseases.

Third. Investigations of the health conditions of lake cities in relation to water pollution and its influence on the spread of infectious diseases.

Fourth. Examination of State and municipal laws and ordinances in relation to the control of infectious diseases, particularly with reference to the prevention of the pollution of lake water.

The work outlined above was taken up at once, and, on account of local conditions, the investigations relating to Lake Erie and the Niagara River were made first. These data have been compiled and published as Hygienic Laboratory Bulletin No. 77.

Data of similar character relating to Lake Huron, Lake St. Clair, and the Detroit River have also been assembled and are being incorporated in a manuscript to be subsequently issued, and similar studies are also being made of Lake Michigan, Lake Superior, and their watersheds.

The facts already collected indicate that there is dangerous pollution of certain parts of the lakes investigated, and that steps must soon be taken to control the same in the interest of the public health. It is the expectation that these investigations will be continued and made to include interstate streams, such as the Mississippi River and its tributaries.

ANTITYPHOID VACCINATION MADE AVAILABLE TO SEAMEN OF THE MERCHANT MARINE.

Following an indication of Haffkine, antityphoid vaccination was first introduced in 1896 by Sir A. E. Wright, and although employed somewhat extensively during the South African War, its importance as a factor in controlling the spread of the disease can only be dated from 1904. It was in this year that, in accordance with Koch's advice, the use of antityphoid vaccines was definitely adopted by the German colonial troops, and new methods of preparing the material were devised by Pfeiffer and others. Soon afterwards typhoid inoculation, which had been discontinued in the British Army at the conclusion of the Boer War, was resumed, especially in the regiments serving in India. The compilation of statistics showing the results obtained was begun, and further investigations were carried out with a view to improving the quality of the vaccines, and thus diminishing the possibility of untoward accidents. Further data were made available when the use of the new prophylactic was recently inaugurated in the United States Army.

The bureau had been watching these experiments with a great deal of interest, as it was thought that if its success became established, antityphoid vaccination might offer a solution to the problem presented by the prevalence of typhoid fever among the seamen of the Great Lakes, a question which has frequently received attention by the bureau. The reports originating in the British, German, and United States Armies were carefully studied, and it was found that vaccinated persons enjoy a considerable degree of protection against the disease, Leishman's statistics showing among vaccinated soldiers 3.8 cases of typhoid fever per 1,000, while among nonvaccinated soldiers the rate was 28.3 per 1,000. The merits of the prophylactic being well proven, it was decided to authorize its application at marine hospitals, and to offer the beneficiaries of the service vaccination against typhoid fever in the same way as vaccination against smallpox is now offered them. The following circular was, therefore, issued on May 5, 1911:

Commissioned medical officers and others concerned:

Experience has shown that the use of antityphoid vaccine affords considerable protection against attacks of typhoid fever, and that the incidence of the disease, particularly among troops, is reduced as a result of its use. It appears advisable, therefore, to render this prophylactic agent available to beneficiaries of the service. Officers are accordingly directed to offer antityphoid vaccination whenever practicable to such beneficiaries, and authorized to administer antityphoid vaccine to those desiring to avail themselves of this privilege. Although the taking of the treatment will be voluntary, some beneficiaries will undoubtedly take advantage of this offer, and by so doing protect not only the traveling public which they serve, but the general public whose water supplies they are liable to infect.

The necessary antityphoid vaccine may be purchased under exigency.

You are directed to acknowledge the receipt of this letter, and in addition render special reports at the end of each fiscal year giving number of persons who have received preventive inoculations and other pertinent data relative thereto.

WALTER WYMAN, *Surgeon General.*

This being the first attempt, in the United States at least, to introduce antityphoid vaccination on any extensive scale in civil life, it was determined to exercise discretion in the matter, and officers were informed that the administration of the vaccine should be offered, but its acceptance would be optional on the part of the patients. The value of this measure among the personnel of the merchant marine can only be ascertained after a few years' trial, when sufficient data should be on hand to establish its results as a prophylactic agent among seamen.

Inasmuch as artificial immunity against typhoid fever can be conferred by antityphoid vaccination, it is important to determine the sphere of usefulness of this measure among civil populations. While the use of antityphoid vaccination should not be so popularized as to supplant the measures now in use and advocated for the prevention of the spread of the disease from the sick to the well, its exact value as a prophylactic should be understood.

A commission appointed by the Academy of Medicine, of Paris, has just issued a report consisting largely of a review of the experiments and statistics upon which the use of antityphoid vaccine is based. The conclusion was in effect that there are grounds for recommending the voluntary employment of antityphoid vaccine as a rational and practical method of diminishing by a sensible proportion the frequency and gravity of typhoid fever, and that it was applicable to all whose profession, whose usual or accidental methods of alimentation, whose daily or frequent association with the sick or with bacillus carriers, expose them to direct or indirect contagion by the bacillus of typhoid fever.

This report was translated by Passed Asst. Surg. J. W. Schereschewsky and published in the Weekly Public Health Reports, of October 6, 1911, together with a list of the establishments licensed by the Secretary of the Treasury to produce and sell antityphoid vaccine in interstate traffic.

INVESTIGATIONS OF MEASLES.

Early in the fiscal year a study of measles was begun in the Hygienic Laboratory, but on account of the difficulty of obtaining material the investigation made but slight progress until the latter part of April, when the presence of an epidemic of measles in the city of Washington gave an opportunity for a resumption of the studies by the Director J. F. Anderson and Passed Asst. Surg. J. Goldberger.

It had been considered, up to this time, by all workers, that monkeys and other animals were not susceptible to the disease. In spite of this, the monkey was found by the workers at the laboratory to be susceptible to the disease with great regularity when the material used for inoculation was obtained at the right period.

These studies, while still in their preliminary stage, have progressed sufficiently to yield some very important results. It has been found that the blood is infective during a certain portion of the preeruption stage and during the first 24 hours of the eruption, but apparently after the eruption has fully appeared the blood is no longer infective. It has also been found that the secretions of the nose and throat immediately before and during the onset of the eruption are also infective.

It has been found possible to carry the infection through at least six series of monkeys and possibly it may be maintained indefinitely in that animal.

It is felt that the laboratory has been particularly fortunate in this work, a preliminary report of which has already been published in the Weekly Public Health Reports, of June 9 and 16, 1911. It is expected that a full report will be subsequently published as a Hygienic Laboratory bulletin.

INVESTIGATIONS OF PELLAGRA.

The importance of pellagra in public-health work continues to attract attention, and while accurate statistics on this disease are still wanting, it is evident that in certain portions of the South the disease is increasing at a rate which demands serious consideration. Pellagra has been reported now from all over the United States, but its area of endemicity seems to a large extent confined to the South, and this section is supplying most of the reported cases. The possible extent of this disease may be gathered from the fact that the health officer of one Southern State is recently reported to have said that there were 50,000 cases in his State alone. The disease also continues to display serious symptoms and to give a high mortality.

As reported, Passed Asst. Surg. Lavinder was sent to Italy last year to make comparative studies of the disease. He returned in October, 1910, and in his report has given a general account of several interesting features of his studies. He visited numerous places in northern Italy and central Italy, met many prominent scientists and others interested in pellagra, visited many public institutions and laboratories, and saw a great many cases of the disease.

Dr. Lavinder reports that every facility for seeing and studying the disease was given him by the Italian authorities. While in Italy he was associated for a time with the field commission of the British pellagra investigation committee, headed by Dr. Sambon, of the London School of Tropical Medicine, and the association proved to be most useful.

He also had an opportunity of witnessing, in the various parts of the Kingdom, the practical administration and results of the Italian national law for the cure and prevention of pellagra, which is based entirely on the theory that the disease is due to spoiled corn. He reports that clinically the Italian and American disease are undoubtedly the same, but that pellagra in America is much more severe than in Italy and the mortality is much higher.

With regard to the obscure etiology of this disease, the most interesting recent development is what might be called the rise of the parasitic idea. It was first suggested by Dr. Sambon in 1905 that pellagra might be due to some parasite of a protozoal nature and conveyed by some blood-sucking insect, acting as an intermediate host. This idea remained only as an interesting suggestion until recently, when, under the patronage of a British committee, supported by public subscription, Dr. Sambon was sent to Italy in order that he might try to establish this idea on a scientific foundation. Dr. Sambon conceived the intermediate biting insect to be a gnat of the genus *Simulium*, and he has recently published a valuable report of his work in Italy and the observations made there by him in support of his theory. Dr. Sambon was followed in this field by Prof. Alessandrini, of the University of Rome, who deems pellagra due to a water-borne trematode worm of the genus *Filaria*.

These two important ideas of the parasitic origin of the disease still lack confirmation, but have produced considerable impression upon those interested in pellagra. Recently the Italian Government has appointed a commission to investigate the various etiologic views of pellagra.

After his return from Italy Dr. Lavinder was assigned to duty at the laboratory and continued his studies on pellagra, devoting his time to the review of the literature on the subject and to experimental work, the results of some of which have appeared in service publications. Of the experimental work done the most interesting are the results reported by Drs. Anderson, Lavinder, and Goldberger on the inoculation of the *Rhesus* monkey with blood, spinal fluid, and nervous tissue taken from pellagrins. A large series of animals was used with negative results. The higher animals seem to have been little used in work of this nature, and these results are of some importance.

The pellagra commission of the service, at a meeting held during the fall of 1910, submitted to the Surgeon General a review of the subject of pellagra and the service activities in connection with this disease. They recommended that the service work be broadened and further work undertaken along these definite lines, viz, collection of statistics, epidemiological studies, and studies on patients. For studies on patients it was suggested that, if possible, the marine hospitals be utilized. In accordance with this suggestion, recommendation was made by the Surgeon General to the Secretary, at whose request Congress, by an amendment to the sundry civil bill, opened these hospitals for the limited admission of patients for scientific study.

In further pursuance of this idea, Drs. Lavinder and Grimm have been assigned to duty at the marine hospital at Savannah, Ga., and this hospital made a base for further studies on pellagra. The hospital at Savannah is a new one and is well located for the purpose. Dr. Grimm has begun certain epidemiological studies in the field. With this hospital equipped for the purpose and at least two regular officers assigned to duty there, the service will be in a position to make more extensive and more satisfactory studies upon pellagra than has hitherto been possible.

INVESTIGATIONS OF ROCKY MOUNTAIN SPOTTED FEVER.

On account of the annual occurrence of Rocky Mountain spotted fever in the Bitter Root Valley, Mont., and because of the serious nature of the disease, it has attracted attention for a number of years. Beginning with the season of 1902, officers of the service were sent to that section of the country annually for four years for the purpose of making investigations. These investigations were necessarily of an intermittent character, and until the disease was transmitted to lower animals, in 1907, studies of the disease were not made outside the Bitter Root Valley.

In 1907 Dr. H. T. Ricketts, of the University of Chicago, and Passed Asst. Surg. W. W. King, of this service, working independently, succeeded in inoculating laboratory animals with the infection of Rocky Mountain spotted fever, which gave new impetus to the studies of the disease. The work was continued by Ricketts, who transmitted the infection from animal to animal by means of ticks, determined the susceptibility of certain of the wild animals of the infected region, and outlined tentative measures that should be enforced for the control of the disease.

The importance of Rocky Mountain spotted fever, from both health and economic standpoints, led the Montana Legislature to appropriate funds for its further investigation, and on the recurrence of the disease in the spring of 1911 the secretary of the State Board of Health of Montana, in a letter of March 3, requested the cooperation of the service in the conduct of such investigations.

On May 6 a conference was held in the bureau, at which were present Senators Dixon and Myers, of Monana, Dr. T. D. Tuttle, secretary of the State Board of Health, and the Surgeon General and other officers of the service. As a result of this conference it was decided that previous investigations had shown that some practical measures might be taken for the prevention of the disease, and that, though further scientific work remained to be done, one of the main steps to be taken at once was a demonstration of the practicability of preventing the disease in a limited area.

On account of the urgency of the matter and the responsibility of the service to cooperate with State health authorities in the prevention of the spread of contagious and infectious diseases, it was determined, with the approval of the Secretary of the Treasury, to send officers to the Bitter Root Valley without delay.

Passed Asst. Surg. T. B. McClintick was accordingly directed to proceed via Helena, Mont., to the Bitter Root Valley May 12, 1911, and after consultation with the State board of health to cooperate with them in studies of Rocky Mountain spotted fever with the view to demonstrating the practicability of preventing the disease in a limited area. Victor, Mont., was selected as the most suitable place for these operations, and he arrived there and began preparations for the work May 26. On account of the magnitude of the duties involved, Passed Asst. Surg. W. C. Rucker was also sent to Victor Mont., to assist Dr. McClintick, and these officers continued their work in the Bitter Root Valley until August 7, 1911.

In company with Dr. T. D. Tuttle, secretary of the Montana State Board of Health, they made an inspection of the Bitter Root Valley and decided upon a badly infected area of about 8 square miles, situated in the foothills a few miles from Victor, as the place at which to carry on the demonstrative operations. As had been recommended by Richetts, the work was to include the destruction of the tick through the dipping of the domestic stock and the killing of the wild animals that act as hosts for the tick, as well as further scientific investigations concerning the susceptibility of the wild animals to the disease.

A concrete dipping vat was constructed and the domestic stock in the area selected was dipped in an arsenical dipping fluid. The number of animals dipped was 584, consisting of horses, cattle, sheep, and dogs. The dipping was not begun until June 14, and as the tick begins to disappear soon thereafter, a redipping of the stock was not considered necessary.

Expert hunters and trappers were employed and a campaign of killing the wild animals was carried on. The methods used were shooting, trapping, poisoning, and carbon bisulphiding. The number of animals killed by poison and carbon bisulphide of course could not be determined. The number shot and trapped was as follows:

Ground squirrels (*Citellus columbianus*)	3,233
Pine squirrels (*Sciurus h. richardsoni*)	109
Chipmunks (*Eutamias luteiventris*)	94
Weasels (*Putorius arizonensis*)	16
Badgers (*Taxidea taxus*)	5
Wood rats (*Neotoma cinerea*)	7
Woodchuck (*Marmota flaviventer*)	1
Total	3,465

The work of killing the wild animals was begun on June 6 and discontinued on August 5, as the ground squirrel, soon after the 1st of August, begins to hibernate. Many of the ground squirrels were found infested with the nymphal and larval forms of the tick.

The work of testing the susceptibility of certain of the wild animals was handicapped for a while on account of the lack of a case of the disease from which the infection could be obtained. However, the infection was obtained from a human case of the disease early in July, and work with the coyote, badger, weasel, ground squirrel, etc., is now being carried on at the Hygienic Laboratory. Further work with the disease will be carried on at the laboratory during the fall and winter and the work taken up again in the Bitter Root Valley early next year.

INVESTIGATION OF CEREBROSPINAL FEVER EPIDEMIC IN SAVANNAH, GA.

In compliance with a request made on behalf of the city board of sanitary commissioners by Dr. W. F. Brunner, health officer of Savannah, Passed Asst. Surg. W. H. Frost was instructed on March 8, 1911, to conduct an investigation into the origin and prevalence of an epidemic of cerebrospinal fever in that city.

On his arrival at Savannah March 12 a conference was had by Dr. Frost with Health Officer Brunner which elicited the following information:

Cerebrospinal fever had been epidemic in Savannah from November, 1898, to January, 1899. This epidemic, which was believed to have originated in a State military encampment nearby, was reported to have been more prevalent among the white population than among the negroes. From 1899 to the present year, although sporadic cases had occurred from time to time, there had been no epidemic of the disease in Savannah.

At the beginning of the year 1911 the health officer, noting an unusual number of deaths reported as caused by cerebrospinal meningitis, issued on January 30 a circular letter requiring physicians to report all cases to the health department, offering the facilities of the city laboratory for diagnosis, and promising to furnish antimeningococcic serum free for the treatment of the poor and at cost to those able to pay. One of the results of this action was that the health department had obtained fairly complete records of cases.

After a study of the data available at the health office, supplemented by information obtained from other sources, an investigation was undertaken by Dr. Frost to ascertain the following points: (1)

Diagnosis of the cases reported; (2) prevalence, mortality, and distribution of the disease; (3) origin and means of dissemination; (4) efficiency of antimeningococcic serum in treatment.

Diagnosis.—The records of the health department showed that bacteriological examinations of the cerebrospinal fluid had been made in 34 suspected cases, in 32 of which (94.1 per cent) the diagnosis of epidemic cerebrospinal meningitis had been established by the finding of gram-negative intracellular diplococci in the exudate. In several cases the diagnosis had been further confirmed by the isolation and cultivation of the meningococcus, and Dr. Frost was able to confirm the findings in all cases in which specimens had been preserved. Some doubt must of course remain concerning diagnoses which were not confirmed by bacteriological examination. It was not possible to estimate the accuracy of the diagnosis in these cases by comparing their mortality with the mortality of cases in which the diagnosis was bacteriologically confirmed, because in most of the latter serum was administered, whereas it was used in very few of the cases not bacteriologically confirmed. However, from clinical reports and observation of a number of cases, it was evident that the great majority of cases were correctly diagnosed.

Prevalence.—The total number of cases reported up to March 21 was 81, distributed as follows:

Within the city limits	63
Suburban	14
Not accurately located	4
Total	81

The population of Savannah, as given for April 15, 1910, is 65,064, of whom it is estimated that about 52 per cent are negroes. The incidence of the disease has therefore been considerably higher among the negroes than among the whites. This may be due to a greater susceptibility of the negroes, or, as seems more probable, to the unsanitary conditions in which they live, which give greater opportunity for the spread of the disease.

An unusually large proportion of the cases (30.7 per cent) were in adults. It is, however, impossible to draw any conclusions from this fact, since epidemics vary greatly in their age incidence without determinable causes.

Seasonable distribution.—The occurrence of cases, as nearly as could be ascertained from the dates of reports received at the health department, was:

November, 1910	1
December, 1911	0
January, 1911	22
February, 1911	34
March (to 21), 1911	24

Owing to the varying intervals between the onset of cases and the receipt of reports it was impossible to ascertain definitely the exact period of greatest incidence of the disease. It was, however, apparently reached during the last two weeks of February and the first half of March. An apparent decline during the third week of March may have been without significance; and while it seemed probable that the disease was on the decline, this could not be definitely asserted.

Geographic distribution.—The 63 cases located within the city limits were platted carefully on a map in such a manner as to indicate the dates of onset by two-week intervals. The map showed that cases were most numerous in the western and eastern borders of the town; less numerous and fairly evenly distributed throughout the central part of the city. The western and eastern borders are the negro quarters and are more densely populated than the rest of the city. The cases were therefore distributed generally in proportion to density of population, with a preponderance among the negroes, in sections where poor hygienic conditions exist.

The map failed to show indications of a progressive spread of the disease from one section of the city, since during the first month of the epidemic cases were widely scattered in all sections of the city. Later cases showed very few instances of apparent spread of the disease in the immediate vicinity.

Mortality.—The mortality was relatively low, viz, 46 deaths in 81 cases—56.8 per cent. It could not, however, be estimated accurately at the time, owing to the fact that a number of cases were still under treatment. Nor can this mortality be taken as a true index of the virulence of the epidemic, since the death rate was somewhat reduced by the use of serum.

The death rate among negroes and whites, respectively, was as follows:

	Cases.	Deaths.	Mortality.
			Per cent.
Whites	19	9	46.4
Negroes	62	37	59.7
Total	81	46	56.8

As regards the seemingly higher mortality among negroes, it is to be noted that a smaller proportion of negroes than of whites received adequate serum treatment; also, that morbidity reports were less complete for the negroes.

Origin and means of dissemination.—The information required proved very difficult to obtain, and was necessarily incomplete in many respects, since the majority of cases were among negroes, usually of low intelligence and unable to give definite answers to some of the questions. Case cards were used for the collection of data. Forty-nine cases were investigated by the city sanitary inspectors detailed by the health officer for the purpose. The following data were obtained:

Cases investigated	49
Families	46
Total persons in families, exclusive of the first case	230
Cases subsequently developing in these families	3—1.3 per cent.

In the three instances where a second case developed in a family the intervals were 2, 13, and 23 days, respectively. In the first instance, where the interval between the first and second case was only two days, infection of the two cases from the same source seemed as probable as infection of one from the other. Assuming, however, that all three cases were true "secondaries," the percentage of cases (1.3 per cent) developing among persons known to have been necessarily intimately exposed to the contagion was so small as to indicate that the disease had been at most very slightly contagious.

In addition to the above instances, where intimate contact with patients preceded the attack, contact with a previous case was reported in 5 cases, as follows: Visit to ill person 8 days before; playing 1 to 3 days before onset with child who afterwards developed disease; visit by family to home of patient 8 days before; visits by families (in two cases) to homes of patients three weeks before.

Schools.—Public schools (6) were attended by 8 of the 49 patients. In 3 of these cases the school may reasonably be regarded as a probable source of infection, having been attended either by a previous case or by the family of a previous case. In addition to the 8 patients who attended school, 6 more were in indirect communication with public schools through other members of the family who attended school. In only 3 of the cases, however, can the schools be considered, from the data at hand, as a possible source of infection.

The data relative to contact may be summarized as follows:

Total cases investigated	49	
Direct contact with previous acute case	4— 8.15	per cent.
Indirect or uncertain contact	4—16.3	per cent.
Possible contact through schools	6—28.6	per cent.
No contact traceable	35—71.4	per cent.

Additional significant facts relative to the contagiousness of the disease are the absence of cases among physicians or their families and the absence of any hospital infections, notwithstanding that cases had been treated in every hospital but one, and the fact that although some attempts at isolation had been made this was not universally observed, and in no case, so far as could be ascertained, was rigidly carried out.

The following conclusions seemed warranted from the data available:

1. The origin of the epidemic—that is, the time and means of introduction into the city—is unknown. It was most probably started by one or more carriers, either resident or coming into the city from some other community.

2. Direct contact with the sick was a relatively small factor in the spread of the disease. Contact, however, appears to have been a not altogether negligible factor. The incidence of the disease within the limits of Savannah (67 cases in 65,064 population) was 1.03 per 1,000; whereas among 230 persons intimately exposed to contagion from the sick the incidence had been at the rate of 13 per 1,000, or 12.6 times greater than the average incidence.

3. The influence of carriers in the spread of the epidemic can only be inferred from the almost certain existence of numerous carriers, from the considerable proportion of cases giving histories of known contact with presumptive carriers, from the general biology of the meningococcus, and from the lack of other adequate explanation of the epidemic. It was impracticable to undertake a more detailed tracing of the possible paths of infection through carriers.

Attention was paid to the possibility of the spread of the infection by household servants, but although members of the families of eight patients were engaged in domestic service, in no instance was there any evidence of the infection being spread in this way.

The complexity of possible paths of infection by carriers is appreciated when it is considered that in the 49 families investigated there were at least 75 adults engaged in work away from home, their work often being of such nature as to bring them into daily close contact with large numbers of persons. As members of 14 of these families were in attendance at public schools, and the patients' families were usually in free communication with neighbors, it is evident that there was ample chance for carriers to be very generally distributed over the entire city.

Results of serum treatment.—The results of serum treatment in this epidemic seemed worthy of investigation for several reasons. Statistics on this point are comparatively scant and have been complied mostly from cases treated by specially selected men, administering the serum supplied by the Rockefeller Institute. So far as known, no statistics have been published showing the efficacy of the commercial serum in the hands of general practitioners. A still further interest attaches to the serum therapy of cerebrospinal meningitis, because so far it appears to have been more effective in saving life than have preventive measures; and, therefore, the furnishing of serum and supervision of its administration may, like those of diphtheria antitoxin and antirabic treatment, become a function of public health officers.

The city health officer, upon request, addressed to each physician who had reported a case of cerebrospinal meningitis a letter of inquiry as to the use of serum. The replies gave the desired information with regard to 59 cases.

The mortality (39.3 per cent) in 28 cases treated with antimeningococcic serum was approximately one-fourth less than the mortality (51.6 per cent) in 31 cases not treated with serum. A further result of serum therapy is shown in the diminution of disabling sequelæ.

Of the 12 cases reported as having recovered without the administration of serum, 5 (41.6 per cent) had some defects remaining, viz:

	Cases.
Deafness	2
Partial deafness	1
Impaired mind	1
Paralysis of leg	1

Of the 11 cases reported as having recovered after the administration of serum, 2 (18.2 per cent) had resultant defects, viz:

Blindness of one eye and paralysis of one leg	1
Paralysis of one leg	1

The results from the administration of serum were best where the serum was administered early in the disease, there having been 5 deaths in the 16 cases (31.25 per cent) in which the serum was used within 3 days after the onset of symptoms. Of the 5 fatal cases in this group, 1 was complicated by puerperal septicemia and 1 by whooping cough and pneumonia. Two of the remaining cases received each a single dose of serum, and the fifth repeated injections of small amounts (7.5 to 15 cubic centimeters).

Recommendations.—The following recommendations were made to the board of sanitary commissioners relative to measures for the control of the epidemic:

1. All patients should be isolated as soon as cerebrospinal meningitis is suspected. Immediate removal to an isolation hospital would be advisable. Since, however, there is no hospital available for this purpose it is recommended that, wherever possible, patients be removed to one of the general hospitals and isolated there. This is recommended because it is believed that isolation can be carried out more effectively in a hospital than at the home, especially in the case of negroes; and because treatment can be given with greater care and efficiency.
2. All houses should be fumigated with formaldehyde gas upon removal, recovery, or death of patient; and, pending such fumigation, the houses should be placarded with a notice prohibiting the entrance of persons other than the family and necessary attendants.
3. Members of patients' families should be excluded from public schools for a period of at least three weeks from the date of last exposure to infection.

Judging from the experience of other communities, and from justifiable inferences regarding the rôle of healthy carriers in the dissemination of cerebrospinal meningitis, the fear was expressed by Passed Asst. Surg. Frost that even such preventive measures might fail to control an epidemic under the circumstances existing in Savannah. It may be expected, however, that they will prevent a certain proportion of cases, and may even, when applied under favorable conditions to the first few cases in a community, sometimes prevent an epidemic.

Dr. Frost concluded the report of his investigation by stating that under the existing circumstances where preventive measures offer comparatively little hope of controlling or perhaps of materially reducing the epidemic, a more practical measure for the saving of lives is the free and early use of antimeningococcic serum. The health department of Savannah had, since January 30, been supplying serum either free or at a reduced price, according to the necessities of the case. It is hardly to be doubted that some lives were saved by this means, notwithstanding certain obstacles, such as inability at times to obtain a sufficient supply of serum, and a tendency on the part of some practitioners to postpone the use of serum too long, and to use it in insufficient amounts. Better results may be expected when the physicians are on the alert to detect the disease, ready to avail themselves of the health department's assistance in diagnosing cases, and convinced of the necessity of administering serum freely and early.

STATISTICAL STUDIES OF POLIOMYELITIS IN ASSOCIATION WITH THE NEW YORK STATE DEPARTMENT OF HEALTH.

During the last six months of 1910 considerable data relative to anterior poliomyelitis were collected by the department of health of the State of New York. For compiling and analyzing the information collected, Dr. E. H. Porter, State commissioner of health, requested, November 29, the services of Passed Asst. Surg. W. H.

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Frost, who had been making studies of the disease in other sections. The request was complied with, as the information obtained would be of value in connection with laboratory investigations then in progress, and useful to the people not only of New York but of other sections of the country where the disease might prevail. The results of a study of the cases reported were embodied by Passed Asst. Surg. Frost in a paper published in pamphlet form by the New York State Department of Health.

The analysis of the data was preceded by a general discussion in which attempt was made to fix the status of poliomyelitis in the light of recent investigations. Consideration was given in this preamble to: Experimental transmission, location of virus in the body and paths of elimination, immunity, clinical features and diagnosis, and increasing prevalence of the disease.

A brief summary was made of the facts already determined regarding experimental transmission and immunity. Special emphasis was placed on the increasing number of cases, the successive outbreaks in this country, showing even with incomplete reports the more and more widespread prevalence of poliomyelitis.

In regard to the location of the virus and paths of elimination, the statement was made that experiments so far tend to prove that the virus is widely disseminated throughout the body, and that it is in all likelihood eliminated to some extent through the naso-pharyngeal mucous membrane.

As chief clinical features recently established were mentioned the following:

1. The constitutional symptoms indicative of general infection are severe and acute.

2. The digestive system almost always suffers rather severe derangement—vomiting, constipation, diarrhea, or colic.

3. The nervous symptoms in the acute stage are extremely varied, showing even before the onset of paralysis widespread involvement of the cerebrospinal axis, viz:

(*a*) Symptoms of meningitic irritation, which are usually of moderate severity, but occasionally even as severe as in epidemic cerebrospinal meningitis.

(*b*) Symptoms of general encephalitis, headache, restlessness, irritability, delirium, and convulsions or apathy, and occasionally coma.

(*c*) Sensory disturbances, of which the most common is pain and hyperaesthesia of a neuritic character. Paresthesias and anesthesia are rare, but not unknown.

4. The paralysis is not necessarily of the flaccid type indicative of destruction of the spinal motor centers, although this type of paralysis is by far the most constant and characteristic. Types of poliomyelitis, classified according to the nature of the nervous lesions, are given by Wickman as follows:

(*a*) The spinal poliomyelitic type, characterized by flaccid paralysis of muscles supplied by spinal nerves—the classical and most common form.

(*b*) The ascending or descending type running the clinical course of a so-called Landry's paralysis.

(*c*) The bulbar or pontine type, characterized by paralysis of the muscles supplied by nerves whose nuclei are situated in the medulla or pons cerebri.

(*d*) The encepholitic type, a very rare type characterized by spastic monoplegia or hemiplegia, due to a lesion in the upper or cortical motor segment.

(*e*) The ataxic type, in which the motor disturbance consists of an acute ataxia without paralysis.

(*f*) The polyneuritic type, presenting a clinical picture similar to acute multiple neuritis.

(*g*) The meningeal type characterized by early severe meningitic symptoms, which may or may not be followed by the development of paralysis.

(*h*) Abortive forms comprising cases which present symptoms of infection without resulting paralysis or other indications of severe lesions of the nervous system. There is at present no well recognized clincial criterion for the recognition of these cases, which have usually been diagnosed chiefly by their close relation to well-marked cases.

As stated by Passed Asst. Surg. Frost, before the onset of paralysis diagnosis is often impossible, but may in some cases be made with reasonable certainty. Poliomyelitis may be suspected in an acute febrile attack with digestive derangement, such as vomiting with marked constipation or diarrhea, accompanied by symptoms indicative of involvement of the nervous system, such as (*a*) pain and tenderness, especially in the region of the spine; (*b*) meningitic symptoms—headache, stiffness and pain of the neck, retraction of the head; (*c*) cerebral symptoms—irritability, restlessness or apathy, more rarely convulsions or delirium; (*d*) motor disturbances—exaggeration or loss of tendon reflexes, muscular twitchings, ataxia, muscular weakness out of proportion to the severity of the constitutional symptoms.

A clinical diagnosis can be made only when the foregoing symptoms are fairly well marked and usually only when the suspicion of poliomyelitis is further confirmed by its known prevalence in the community.

Examinations of the blood, and more particularly of the cerebrospinal fluid, are aids to early diagnosis, and promise to be of very great value.

The blood changes believed to be characteristic of poliomyelitis are a diminution in the total number of leucocytes, with a relative increase in the number of lymphocytes.

The changes in the cerebrospinal fluid which have been more fully established are:

1. An increase in the amount and tension of the fluid. This takes place early, before the onset of paralysis and probably before the onset of recognizable constitutional symptoms.
2. The fluid is usually quite clear, but when drawn very early may be slightly opalescent. Sometimes a clot may be formed on standing.
3. Microscopic examination shows an increase in the number of cellular elements present, sometimes several hundred per cubic centimeter. The cells are mostly large mononuclears or lymphocytes, although in the very early stages polymorphonuclear cells may predominate. The increase in cellular elements is most marked in the prodromal and early acute stage. With the subsidence of acute symptoms the cellular elements decrease in number and the cerebrospinal fluid returns to normal.

Stained preparations and cultures of the cerebrospinal fluid, if carefully made, fail to show the presence of any bacteria.

In certain cases of poliomyelitis the clinical appearances are so similar to those of epidemic cerebrospinal meningitis that the differentiation can be made only by lumbar puncture.

The diagnosis of abortive cases has been made chiefly upon (1) their association with frank cases of poliomyelitis and (2) the nervous symptoms—meningitic, neuritic, cerebral, or motor.

POLIOMYELITIS IN NEW YORK IN 1910.

Passed Asst. Surg. Frost in his study of the New York cases devoted attention to the following points: Prevalence of the disease, distribution in different sections of the State, distribution with regard to density of population, death rate as compared with other diseases, seasonal prevalence, factors of probable importance in its dissemination, age and sex incidence, environment, contagiousness, consideration of early and other symptoms, distribution of paralysis, and prognosis.

In regard to case distribution it was shown that the cases were widely scattered over the State, with no apparent relation to any central focus. The disease was, however, most prevalent in certain rather definitely limited areas, viz, in the counties bordering on the St. Lawrence River and in an area bounded on the north by Lake Ontario, south by Pennsylvania, east by a line drawn south from the eastern end of Lake Ontario, and west by Monroe, Livingston, and Cattaraugus Counties.

The fact was noted that the populous southeastern corner of the State remained comparatively free, a fact which may be of significance in connection with the distribution of cases in 1907. In that year it was noted that a number of cases occurred in towns along the Hudson River as far up as Poughkeepsie, but none north of that. In 1907 there were 25 cases in Poughkeepsie. In 1910 the cases along the Hudson River were mostly north of Poughkeepsie, with none reported from that city. This is in accordance with the observations made in other places, that communities where poliomyelitis has been unusually prevalent one year remain comparatively free for one or more years thereafter. The disease recurred, however, in at least one locality where it was unusually prevalent in 1907, viz, in Schenectady. In this city there was a small epidemic of 29 cases in 1907, and again in 1910 23 cases have been reported.

DISTRIBUTION WITH REGARD TO DENSITY OF POPULATION.

By grouping cities according to size, on the assumption that the density of population is generally proportionate to the size of the city, it was shown that poliomyelitis was actually more prevalent in proportion to population in the smaller villages and rural communities than in the larger, more densely populated cities. Such a distribution has been previously noted, both in Europe and in this country, as generally characteristic of poliomyelitis, and constitutes one of the most puzzling features of its epidemiology. Most of the diseases which are generally accepted as directly transmissible from person to person are relatively more prevalent in urban than in rural districts, the most obvious explanation being the greater crowding, and consequently increased opportunities for contact infection in the more densely populated cities.

DEATH RATE FROM POLIOMYELITIS.

The mortality caused by poliomyelitis as compared with other diseases was exhibited in the following table, the death rate being given for purposes of comparison for both urban and rural communities:

Deaths per 100,000 population from various infectious diseases in rural and urban communities in New York State, exclusive of the city of New York.[1]

Diseases.	Community.	1908	1909	1910
Typhoid	Urban	25.38	21.07	22.70
	Rural	15.59	14.64	15.42
Diarrhea and enteritis (under 2 years)	Urban	....	82.92	97.91
	Rural	....	48.80	60.07
Measles	Urban	6.55	8.62	15.50
	Rural	3.47	4.66	8.52
Scarlet fever	Urban	13.53	15.68	23.55
	Rural	4.70	4.66	8.22
Whooping cough	Urban	8.55	9.67	11.75
	Rural	6.78	8.39	8.39
Diphtheria and croup	Urban	21.92	18.40	23.75
	Rural	12.95	10.23	10.27
Influenza	Urban	19.05	9.56	13.75
	Rural	35.50	25.68	34.00
Cerebrospinal meningitis	Urban	4.16	3.76	4.00
	Rural	4.70	3.85	3.37
Pulmonary tuberculosis	Urban	137.64	131.91	125.26
	Rural	124.42	114.85	120.61
Poliomyelitis (cases)	Urban	....	....	6.05
	Rural	....	....	8.61

	1908	1909	1910
Urban	1,847,518	1,912,665	1,999,783
Rural	2,360,518	2,336,015	2,347,048

SEASONAL DISTRIBUTION.

The seasonal distribution in New York was found to be similar to that noted elsewhere, the curve rising abruptly in midsummer, reaching its apex in late summer or early autumn, then falling abruptly with the advent of cold weather. Comparison with the incidence in Massachusetts in 1907 and 1909 showed that in Massachusetts in 1907 the disease was somewhat later and in 1909 distinctly earlier in its season of maximum prevalence. The seasonal distribution of cases in the New York epidemic of 1907 corresponds roughly to the distribution in New York in 1910, with the difference, however, that in 1907 the number of cases increased more abruptly in August and fell off much more abruptly in October.

FACTORS IN SPREAD.

The greatly increased prevalence of poliomyelitis in late summer and early fall months has suggested three factors as of very probable importance in its dissemination:

1. *Insects.*—The season of greatest prevalence of poliomyelitis corresponds approximately to the commonly observed maximum prevalence of many insects. Since poliomyelitis continues, though greatly diminished, throughout the cold months, such insects as are prevalent only in warm weather may in all probability be excluded, leaving for consideration insects perennially present but increased in the summer. An insect to merit consideration as an important factor in the transmission of poliomyelitis must show certain biologic tendencies, viz,

(*a*) Prevalence throughout the year over a wide area of country (the United States, Europe, Australia).

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[1] The division of population into rural and urban according to statistics of the department of health is as follows:

(*b*) Increased prevalence in late summer and fall months.

(*c*) Greater prevalence in small towns and rural districts than in large cities.

(*d*) Comparatively even distribution among the various social strata.

2. *Dust.*—The importance of dust as a factor in the spread of poliomyelitis has been advanced, especially by Hill, of the Minnesota State Board of Health, on the following grounds:

(*a*) The disease is most prevalent in the dry dusty season and generally in the more dusty rural towns than in larger paved cities.

(*b*) It attacks chiefly those who come most into contact with the soil, viz, children from 1 to 10 years of age, who play in the dirt, and among older persons, predominantly males, who are out of doors more than females.

(*c*) In several instances the sprinkling of streets in a town has been followed by a rather abrupt checking of the epidemic.

Hill suggests, as the probable infective agent in dust, the excrement of horses that act as carriers.

While the data presented in favor of the above argument are striking, there are several gaps in the evidence, the most serious of which is in regard to the occurrence of poliomyelitis in horses. Although horses are occasionally afflicted with a disease clinically resembling acute anterior poliomyelitis, experiments have so far failed to demonstrate any etiologic relation between this disease of horses and the human disease. In one instance, however, histologic lesions resembling those of human poliomyelitis have been found in the spinal cord of a horse suffering from motor paralysis.

3. Increased travel during the summer months, giving greater opportunity for the dissemination of the disease by contact, has been suggested as a possible explanation of its greater prevalence in summer. It may be accepted as reasonably certain that during the summer months there is more travel than in the winter and spring. While definite information is lacking as to the proportion of increase in travel in summer, it would hardly seem sufficient to offer a plausible explanation of the enormously increased prevalence of poliomyelitis, especially in view of the fact that most of the contagious diseases show no such increase during the same season.

4. It has been suggested that the increased prevalence of poliomyelitis during the summer and fall months is etiologically related to the increased prevalence of diarrheal diseases at this season. It may be supposed that diarrheal troubles predispose to poliomyelitis, either by local injury to the digestive tract, or lowering of vital resistance in general, or that causes similar to those which increase the prevalence of diarrheal diseases during the summer likewise increase the prevalence of poliomyelitis. Just what these causes may be is not known; it is probable that they are very complex, embracing perhaps changes in diet, changes in intestinal flora, and increased susceptibility to infection, either consequent upon the foregoing conditions or superadded.

The relation in seasonal prevalence between infantile diarrhea and poliomyelitis in New York during 1910 was briefly discussed by Dr. Frost. While no attempt was made to draw inferences from the relation shown, attention was called to the following facts suggesting that poliomyelitis is primarily an intestinal infection and related as above suggested to the more usual digestive infections of summer and autumn.

(*a*) The early stage of poliomyelitis is commonly marked by digestive derangements.

(*b*) Disturbances of health preceding the attack, while not common, are when they occur most often gastrointestinal.

(*c*) The greatest incidence of poliomyelitis, as of diarrheal diseases, is in the first half decade of life, with this marked difference, however, that enteritis is relatively more common in the first two years of life than is poliomyelitis.

(*d*) Poliomyelitis, if contagious, must be mildly so. Diseases in which infection is known to take place through the digestive tract are, generally speaking, less highly contagious than those transmitted through the respiratory tract.

AGE AND SEX.

The age and sex of the 227 cases reported in detail was presented in the following table:

Number and percentage of cases occurring at various ages.

Ages.	Males.	Females.	Total.	New York, 1910.	New York, 1907.	Massachusetts, 1909.
	Number.	*Number.*	*Number.*	*Per cent.*	*Per cent.*	*Per cent.*
Under 1 year	4	8	12	5.3	8.5	7.15
1 to 4, inclusive	60	56	116	51.1	78.2	59.15
0 to 4, inclusive	64	84	128	56.4	86.7	66.3
5 to 9, inclusive	20	22	42	18.5	10.3	18.7
10 to 14, inclusive	10	13	23	10.2	1.9	7.2
15 to 19, inclusive	9	7	16	7.1	0.7	2.5
20 to 29, inclusive	11	2	13	5.8	0.28	3.4
30 to 39, inclusive	2	1	3	1.1	0.12	1.1
40 to 49, inclusive	1	0	1			
50 and over	1	0	1	0.45	0.	0.31
Total	118	109	227	100	100	100

ENVIRONMENT.

Little information regarding the influence of environmental conditions was obtained excepting such as served to exclude pretty definitely as probable factors of any importance certain conditions, such as dampness, low elevation, and insanitary surroundings. The relative proportion of detached and tenement houses, high and low situations, dry and damp houses, was probably quite close to the average for the communities from which reports were received.

Information was lacking on several interesting and possibly important points, viz, the weather conditions in each locality, especially as regards the prevalence of dust, the prevalence of insects in and around dwellings, the proximity of domestic animals and the occurrence of paralytic diseases among the latter.

CONTAGIOUSNESS.

Data relative to the contagiousness of poliomyelitis were compiled from answers to questions as to the occurrence of multiple cases in the same family; the occurrence of cases among neighbors and acquaintances, and contact with them; and the occurrence of cases among school children.

The information so obtained was necessarily very imperfect, and little reliance can be placed in the figures, except those relative to certain direct contact with previous known cases. The information relative to probable contact with previous cases in the vicinity was not sufficiently detailed and specific to be of real value, and it was therefore impossible to draw conclusions with any degree of certainty.

PROGNOSIS.

Of the 227 fully reported cases, 34, or 15 per cent, were fatal. These figures are subject to a considerable cause of error, viz, that the severe cases have been more generally recognized and reported than the mild ones. It is, however, impossible to check up these figures by comparison with statistics collected elsewhere, because these also, when embracing large numbers of cases, are subject to the same error, and when embracing only a few cases, more closely studied, vary within very wide limits.

Comparison with the following statistics and estimates, collected from several sources, showed that the mortality as estimated from the above data was neither remarkably high nor remarkably low:

Reported by—	Place.	Year.	Total cases.	Deaths.	Per cent mortality.
Caverly	Connecticut	1894	126	18	14
Wickman	Sweden (general)	1905	868	145	16.7
Do	Trastena, Sweden	1905	26	11	42.3
Do	Atvidaberg, Sweden	1905	41	4	10
Do	Smedjeback, Sweden	1906	23	5	22.7
Committee of investigation	New York[1]	1907	3,000	100	5
Hill	Minnesota	1909	383	68	24
Lovett	Massachusetts	1909	628	51	8

[1] Estimated.

A comparison of the mortality at different age periods, as determined in Massachusetts, 1909; Minnesota, 1909; and in New York, 1910, was made with the following results:

Epidemic.	Under 1 year.			1 to 10 years.			Over 10 years.		
	Cases.	Deaths.	Mortality.	Cases.	Deaths.	Mortality.	Cases.	Deaths.	Mortality.
			Per ct.			*Per ct.*			*Per ct.*
Massachusetts, 1909	44	7	16.0	494	20	4.0	77	16	20.0
Minnesota, 1909	21	8	38.0	235	37	15.7	69	24	34.8
New York, 1910	12	4	33.3	158	18	11.4	54	12	22.2
Total	77	19	24.7	887	75	8.4	200	52	26.0

It seems, therefore, quite a general rule that the prognosis in poliomyelitis is more grave in children under 1 year of age and in persons over 10 years of age than in children between 1 and 10.

No significant difference is apparent between males and females as regards fatalities, as shown in the following summary:

Epidemic.	Males.			Females.		
	Cases.	Deaths.	Mortality.	Cases.	Deaths.	Mortality.
			Per cent.			*Per cent.*
New York, 1910	118	17	14.4	109	17	15.6
Minnesota, 1909	188	42	22.3	137	27	20.0
Total	306	59	19.2	246	44	17.9

While the figures were too small to warrant generalities, they indicate that the gravity of the prognosis as regards life depends upon two considerations in the distribution of paralysis:

1. The location of the cord lesion. The prognosis is graver when the paralysis affects the arms alone than when it affects the legs only. This is to be expected in view of the proximity of the vital bulbar centers and the cervical segment of the cord.

2. The extent of the cord lesions. The prognosis is more grave when both legs or both arms are affected than when only one extremity is involved.

Studies in Tuberculosis.

At the annual meeting the National Association for the Study and Prevention of Tuberculosis, held in Denver June 20 and 21, 1911, two papers were presented, prepared from clinical studies of tuberculosis made at the Tuberculosis Sanatorium, Fort Stanton, N. Mex.

In "Prognosis in pulmonary tuberculosis," by Passed Asst Surg. H. S. Mathewson, 500 consecutive admissions were reviewed, ending a year previous to the study, the prognosis in each case being made at the first examination within one week after arrival. The prognoses were verified in 82.4 per cent of the cases. In a considerable proportion of the remainder the causes of error appeared to be unavoidable, such as hemorrhage and pneumothorax or intercurrent disease, on the one hand spoiling an otherwise favorable result, or by an unexpected resistance developing in far-advanced disease, happily reversing or qualifying an unfavorable prognosis. The study bears out the wisdom of bureau order, issued in 1909, against transferring to Fort Stanton the following classes of cases: Patients whose pulse persistently remains above 100 and temperature above normal during rest in bed, chronic fibroid cases and those complicated by asthma, by uncompensated valvular disease of the heart, or by chronic alcoholism.

The second paper was prepared by the junior medical officers at Fort Stanton. Report was made of 24 cases treated with tuberculin B. F., 10 treated with "Tuberculinum purum," and 18 treated with deep muscular injections of mercuric succinimide. The patients were present at the sanatorium for approximately one year before and one year after, as well as during this specific treatment, which occupied several months. They were, therefore, under constant climatic and hygienic conditions long enough to enable the officers to judge. unbiased, the results of this treatment. The three agents were given according to the methods of their chief advocates, all the conditions being scrupulously complied with. The conclusions were as follows:

1. When given in dosage within the physiological limit of safety, the buillon filtrate has no effect on the general course of the disease.

2. Tuberculinum purum produced, like any other tuberculin, the usual toxic phenomena when proper dosage was exceeded and otherwise effected no change in the general course of the disease. The great necessity for the standardization of tuberculin, mentioned in the annual report of 1910, was fully illustrated in this series of cases.

3. No evidence was found that mercury has any specific action in pulmonary tuberculosis.

Some further clinical studies were embodied in an article on "Cough during auscultation in the diagnosis of pulmonary tuberculosis," by Passed Asst. Surg. F. C. Smith, published in the Journal of the American Medical Association, January 28, 1911. It was pointed out that the early diagnosis of active pulmonary tuberculosis depends quite frequently on the finding of râles, which are only audible in the inspiration that follows a light cough. The technic of eliciting these sounds was described as routinely employed in the examination room at Fort Stanton.

Clinical study of pulmonary hemorrhage has been continued with practically the same conclusions as drawn from the analysis made last year of 56 deaths from this cause. Nine additional deaths from hemorrhage have occurred at the sanatorium, 6 immediately fatal and 3 due to inhalation pneumonia, representing 8.5 per cent of the total number of deaths during the period as compared with 10.7 per cent dead from hemorrhages in the group previously studied. There have now been 65 fatalities from hemorrhage at this station out of a total of 630 deaths occurring among tuberculous patients.

It is believed that the incidence of pulmonary hemorrhage is not more frequent at this altitude (6,200 feet) than at sea level, but in the absence of any other statistics showing as high a mortality from this cause it may be assumed that pulmonary hemorrhage is more frequently fatal at high altitudes.

Some clinical observations were made by Asst. Surg. A. J. Lanza in regard to the positions assumed in sleep by tuberculous patients with reference to the location of their pulmonary involvement. Out of 264 consecutive admissions, 93, or 35 per cent, had to assume a certain constant posture in sleeping to relieve special symptoms, usually cough or dyspnea. Fifty-nine, or 63 per cent, of this number selected the side opposite that of greater involvement, this tendency being especially manifest in those with unilateral cavity, the strongest preference being shown to sleep on the right side when the cavity was on the left. No conclusions valuable in diagnosis or prognosis have yet been drawn from these observations.

RABIES AND ANTIRABIC TREATMENT.

During the fiscal year ended June 30, 1910, 128 persons exposed to infection with rabies applied for and commenced antirabic treatment at the Hygienic Laboratory. Of these, 114 completed the treatment, 10 discontinued before completion, and 4 were still under treatment at the end of the year. Five patients who commenced treatment the previous year completed the treatment during this year.

Of those treated during the year, 88 per cent were exposed to infection by animals known by laboratory methods (Negri bodies, inoculation, or both) to be suffering from rabies. In 5 per cent the diagnosis of rabies was based on the symptoms only of the animal, while in the remaining 7 per cent the diagnosis was negative or doubtful.

No deaths from hydrophobia are known to have occurred in any of these patients, nor have there been any untoward results from the treatment.

The 128 persons referred to came from the following localities where the exposure occurred:

Virginia	29
Maryland	20
West Virginia	4
Panama Canal Zone	1
District of Columbia	74
Total	128

During the year 777 treatments were sent to State health officials on their request, as follows:

Alabama	270
California	117
Delaware	12
Iowa	38
Illinois	17
Kentucky	4
North Carolina	129
North Dakota	5
Oregon	2
Rhode Island	1
South Carolina	25
Virginia	67
Wisconsin	88
Washington	2
Total	777

In addition 12 shipments of sufficient virus to commence treatment have been sent to the Isthmian Canal Commission.

Results from the use of glycerinated virus.—Reports from State health officials who have used the virus from the Hygienic Laboratory are complete to December 31, 1910. Combining the figures of their reports with those of persons treated at the laboratory, it is shown that from the beginning of the antirabic service in April, 1908, until December 31, 1910, 1,414 persons were treated with glycerinated virus. Of these 5 have died from hydrophobia, or 0.353 per cent. But 1 of these died more than 15 days after the end of treatment, or 0.071 per cent.

These figures compare favorably with those of institutions where the nonglycerinated desiccated virus is used.

INVESTIGATIONS OF HOOKWORM DISEASE.

During this last fiscal year the Hygienic Laboratory has continued its investigations of hookworm disease, and cooperated with Southern State health authorities and with the Rockefeller sanitary commission in the movement for eradication of the disease, the activities of the service officers engaged in this work being devoted to research and technical matters.

In the last annual report reference was made to a munificent private donation for the eradication of hookworm disease from the United States, the fund to be administered by a board of trustees. The bureau has been kept informed of the progress of the work and the methods adopted to carry it on.

The State is recognized as the unit for organization, and upon application from any State board of health for support the Rockefeller commission for the eradication of hookworm disease first convinces itself of the existence of the disease in the State. The board of health then appoints a State director of sanitation, who has general direction of the movement for his State and selects his own assistants. There are in all about 60 men employed by the various boards of health for field work. All of the men selected for the work must be satisfactory to the board of trustees, and the board then appropriates the necessary money to supplement the money available in the States.

The campaign is carried on by the publication of bulletins for free distribution, by an extensive correspondence, by lectures, and by personal visits.

A uniform campaign is now actively organized by the commission for Virginia, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Louisiana, Arkansas, and Tennessee, while Florida is carrying on an independent campaign. Up to December 31, 1910, the physicians employed under the Rockefeller fund had given 1,240 lectures in 9 States and had reached more than 196,000 people. In these lectures the physicians have described the disease, shown how it can be treated, and they have laid special stress upon teaching the people the dangers of soil pollution and how to stop this pernicious custom. During the first year's work 546,000 copies of special bulletins and folders were distributed free by the State boards of health. Numerous popular articles were supplied to the lay press, which is now cooperating actively in the movement. The public schools also are said to be cooperating in a very satisfactory manner.

The rôle played by the Public Health and Marine-Hospital Service in this cooperation is almost exclusively on the technical side of the question. Several bulletins have been published dealing with the symptoms, treatment, and prevention of the disease, a series of hookworm charts has been issued for the use of physicians in the field, and various experiments have been conducted on the viability of the parasite and the treatment of the infection. The microscopic examinations of specimens, which formerly were made in large numbers by the Hygienic Laboratory, are now being made chiefly by the laboratories of the State boards of health.

Viability experiments.—A series of parallel experiments is being conducted by the service at the Hygienic Laboratory at Washington, D. C., and at the United States marine hospital at Wilmington, N. C.

At Wilmington, in cooperation with Surg. C. H. Gardner, Prof. Stiles has reached the following results:

(1) It is not safe at present to assume that the sand under and around a privy is entirely free from hookworm infection for about 5 months (151 days) after the privy was last used.

(2) After about 4 months (120 days), however, the infection may be very greatly reduced, and possibly in some instances entirely killed.

(3) After about 5 months (150 days) in sand, live *Ascaris* embryos in the eggs may be found, even when all the hookworm larvæ observed are dead. *Ascaris* eggs, apparently alive and normal, were found after 156 days.

(4) Hookworm eggs may be identified in sand cultures 117 days old.

(5) When fecal material is subjected to decomposition in water for 70 days (namely, about 2⅓ months) the mass of hookworm eggs die, but a few can survive.

(6) No hookworm egg has as yet been found alive in feces subjected to decomposition for 117 to 149 days, namely, about 4 to 5 months.

(7) It is very probable from present data that, under conditions under which the above observations were conducted, if fecal material containing hookworm eggs is subjected to decomposition in water for about three months all hookworm infection will be dead. If this probability is confirmed by further observations, then, viewed from the standpoint of hookworm infection alone, the effluent from the LRS sanitary privy, described in Public Health Reports, 1910, pages 1619–1623, should be stored three months before being used as fertilizer.

(8) In feces allowed to decompose in water, *Ascaris* eggs resist the decomposition better than do the hookworm ova. At the end of about 4 months (117 to 121 days), however, at least 80 per cent of the *Ascaris* eggs appear to be dead.

(9) The action of chloride of lime in the strength of approximately one-fourth pound to 10½ quarts of water for 22 to 40 hours does not kill hookworm eggs.

COOPERATION WITH THE NATIONAL ASSOCIATION FOR THE STUDY AND PREVENTION OF INFANT MORTALITY IN THE PREPARATION OF AN EXHIBIT.

At the request of Dr. M. L. Price, secretary of the State Board of Health of Maryland, and chairman, committee on exhibition of the American Association for Study and Prevention of Infant Mortality, Passed Asst. Surg. J. W. Schereschewsky was detailed on October 6, 1910, in addition to his regular duties, to serve as medical officer in charge of the exhibit to be prepared for the annual meeting of the association at Baltimore, Md., November 9–10, 1910.

This exhibit relative to infant mortality and the many other factors connected with that question was intended to serve as an object lesson not only to the members of the association, but more specially to the general public who were invited to attend the meetings. It proved highly instructive, and the value of the cooperation of the service was freely recognized by the officers of the association.

Several branches of the Federal Government were represented at the meeting. Two bureaus of the Agricultural Department and the Bureau of the Census sent valuable exhibits. Through the agency of the Surgeon General, the Secretary of the Smithsonian Institution loaned one of the collections under his care, consisting of appropriate articles such as models, and clothing and utensils used by the Indians in the care of infants. A small exhibit relative to hookworm disease was also contributed by the Hygienic Laboratory, and was appropriate because of the special interest manifested in the eradication of that disease at the time.

DISPOSAL OF NIGHT SOIL.

In the annual report for 1910 reference was made to the necessity of sanitary disposal of night soil especially in rural districts not supplied with sewer connections, and the records of observations of Prof. C. W. Stiles of the Hygienic Laboratory were presented regarding privy conditions on farms in six different States. During the past year he has made further studies of the subject and has collected statistics as to privy conditions at 4,825 American farm homes, and finds that 2,664 or about 55 per cent of them have no privy of any kind.

It is a matter of common knowledge, too, that a large proportion of the privies at farm homes are unscreened and otherwise insanitary. This condition of affairs requires that the public generally and the farmers in particular give their active and hearty support to the present movement for the improvement of rural sanitation.

Insanitary privies in suburbs and small towns.—A study of the privy conditions in the suburbs of some cities and in numerous small towns shows a condition of sanitation which is not only shocking but dangerous. The ordinary type of privy found is that known as the "surface privy open in back." Flies breed in and feed upon the excreta and then fly to the habitations. These privies are very conducive to the spread of typhoid fever, hookworm disease, Cochin China diarrhea, amebic dysentery and various other maladies.

If an epidemic of Asiatic cholera were to start in this country, or if some "cholera carriers" were to live in localities provided with this type of insanitary privy, the control of the disease would be exceedingly difficult. These privies are a menace to the public health, and the commercial bodies should be alive to the situation and aid the local authorities to arouse the public to a sense of its dangers.

Experiments on flies in relation to disposal of night soil.—In connection with the general subject of the disposal of fecal material Prof. Stiles and Surg. Gardner have conducted at the marine hospital, Wilmington, N. C., some experiments on flies which throw a new light on the problem of the disposal of night soil.

It is a well-known fact that if graves are opened they are found to contain numerous insects. The circumstances under which some bodies are buried seem to exclude the possibility that the progenitors of these insects were buried with the body. The conclusion seems justified that the insects burrow down to the grave. This brought up the question as to whether the insects can work their way to the surface.

Fecal material containing fly larvæ was taken from surface privies and buried, with the following results:

(1) If flyblown fecal material is buried under 6½ inches of sterilized sand, flies (*Ophrya leucostoma*) will crawl through the sand and complete their development.

(2) If flyblown fecal material is buried under 17 inches of sterilized sand, flies (*Sarcophaga* sp.) will crawl through to the surface and complete their development.

(3) When flyblown fecal material was buried under 48 inches of clean (unsterilized) sand, flies (*Musca domestica*) issued from the surface.

(4) When flyblown fecal material was buried under 72 inches of clean (unsterilized) sand, flies (genus and species undetermined) issued from the surface.

The observations reported on *Ascaris* and flies have an intimate bearing on the hookworm and typhoid problems, because the preventive measures (as respects soil pollution) aimed against any one of these infections will inhibit the others also. Accordingly, it is necessary to adopt uniform measures that will be satisfactory in fighting all the soil-pollution diseases and pests.

Experiments with special type of wet-system privy.—In the last annual report reference was made to experiments with privies, and especially the materials that should be used in dry-system privies.

This so-called "dry system" for the disposal of night soil has been studied this last year by several officers of the service, including Surg. Gardner, Passed Asst. Surgs. Lumsden and Roberts, and Prof. Stiles. Their general results are very unfavorable to the "dry system" so commonly in use in the United States.

A special type of wet-system privy has been developed, known as the LRS privy, and while the experiments are not entirely complete, the results obtained indicate its value for general adoption. It was described in Public Health Reports, 1910, volume 25 (45), November 11, pages 1619–1623.

INQUIRY INTO THE SANITARY ASPECT OF A PROPOSED DAM BETWEEN MINNEAPOLIS AND ST. PAUL, MINN.

In response to an official request, Passed Asst. Surg. L. L. Lumsden, on January 6, 1911, having just completed his typhoid investigations at Des Moines, Iowa, was detailed to investigate the effects from a sanitary standpoint of a proposed dam across the Mississippi River between Minneapolis and St. Paul. Apprehension had been expressed of a baleful influence which the backing up of sewage-polluted water might have on the public health.

At a conference with the secretary, the engineer, and the epidemiologist of the State Board of Health of Minnesota an examination was made of charts showing the location and the anticipated effect of the dam on the flowage of the river, etc. An inspection of the site was then made and detailed information obtained with respect to the construction of the dam and lock.

An inspection was also made of the river from the site of the dam to Minneapolis, particular attention being given to the outlets of the sewers from Minneapolis and St. Paul and to the areas in the river basin which are now without the river channel but which will become submerged after the dam is completed.

Dr. Lumsden reports that the primary purpose is to improve the navigability of the river. A lock is being constructed at one end of the dam, and the depth of the river for some distance above will be increased by about 30 feet. Thus the river as far up as Minneapolis will be made navigable for vessels of considerable draft. Furthermore, the fall of the water from the dam will afford a source of power which may be employed to operate lighting plants for St. Paul and Minneapolis, and for other economic uses.

Not only will the project cause an increase in the height of the water in the river; but the river will be extended considerably beyond its present channel, though it will still be confined to the deep, wide gorge in which the channel now lies.

Within a few miles above the site the river receives the sewage from about 350,000 persons. Questions had arisen as to possible stagnation of the water above the dam, and its influence on the discharge of sewers and the possible effect on certain wells in the vicinity of the river. These several question were considered and discussed in Dr. Lumsden's report as follows:

1. *Effluvia from stagnated sewage-polluted water.*—Although the dam will cause the height of the water in the river to be raised about 30 feet, and a considerable extension of the river beyond its present channel, the river will be still strictly confined between the abrupt rocky bluffs forming the two sides of the gorge in which the river's channel now lies. The tops of the bluffs will then be about 70 feet above the surface of the water, so that there is no likelihood that the country adjacent to the gorge will be inundated in times of high water.

The average discharge of the Mississippi River at the site of the dam, probably, is about 16,000 cubic feet per second. At Anoka, Minn., located about 20 miles above (upstream from) Minneapolis, discharge measurements recorded by the United States Geological Survey were as follows:

	Second feet.
Sept. 16, 1905	12,200
Nov. 3, 1905	9,650
Dec. 27, 1905	7,910
Apr. 12, 1906	24,000
May 25, 1906	22,200
Average	15,192

Between Anoka and Fort Snelling the river receives several small tributary streams, so that at the site of the dam the discharge must average somewhat more than it does at Anoka; and probably is never less than 8,000 second feet. The rate of flow of the river at Fort Snelling is said to be about 3 miles per hour. According to authorities on the subject, in streams flowing continuously at this rate, a dilution sufficient to prevent offense usually will be effected if the streams' discharge be from 2.5 to 7 cubic feet per second for the sewage from every 1,000 persons. On this estimate the Mississippi River as it now flows by Fort Snelling, and carrying the sewage from about 350,000 persons, has a minimal discharge sufficient to dilute the sewage from over 1,000,000 persons to such a degree that offensive gases resulting from decomposition of the sewage would not escape from the water in such amount as to be objectionable as a nuisance to persons residing near the river. If there should not be sufficient concentration of sewage in the water to afford substance for putrefactive changes with the exhalation of offensive gases in such quantity as to become a nuisance, it is not reasonable to believe that disease-producing germs would arise in the effluvia from the river and be conveyed through atmospheric currents to persons in the vicinity. In fact, there is no conclusive evidence that even the effluvia from water highly polluted with sewage and in which very offensive putrefactive changes are taking place will convey disease-producing germs, although such disagreeable gases in the atmosphere may operate as do those from such industrial establishments as glue factories, etc., in some indirect or perhaps direct ways to the detriment of the health of persons. So far as I could ascertain no serious complaints have been made by persons living near the site of the proposed dam about disagreeable exhalations from the river. After the dam has been constructed, the volume of water flowing down the river will, of course, be the same as before; but as the dam will cause a backing up of the water of the river a certain amount of sewage sludge will settle above the dam and along with the sludge in the water immediately above the dam putrescible sewage may gather, at times, in considerably higher concentration than it does now in the water flowing unobstructed down the channel of the river.

To prevent a continued concentration of pollution immediately above the dam will be (1) the increased volume of water in the lakelike collection, with consequent increased opportunity for natural purification processes to take place; (2) a sluice gate at the base of the dam, which will be opened in times of high water, and so permit whatever sludge accumulation may be at the base of the dam to be washed through; (3) the operation of the lock at one end of the dam.

This whole question seems to be one which engineers should be able to decide definitely; but considered on general principles and from a lay standpoint it seems highly improbable that at the present degree of pollution of the water the presence of the dam will cause a concentration of putrescible sewage in the water to such a degree that effluvia from the river will become an intolerable nuisance or a serious menace to health.

2. *Interference with discharge from sewer outlets.*—According to information received from engineers familiar with the situation, there is no horizontal sewer connected with the trunk sewers discharging into the river which is not on an elevation of at least 100 feet above the surface of the water in the river in its present channel; and therefore an increase of 30 feet in the height of the water in the river can not be expected to interfere with the discharge from the sewer outlets. If the sewerage system should be extended at any time to territories between which and the surface of the water in the river after the dam is constructed, there would not be sufficient gradient to provide for a free discharge of the sewage into the river, provision would have to be made either for disposing of the sewage from such territories by some method other than the discharge of it into the river, or for extending the trunk sewers from such territories down the river, so that they would discharge below the dam.

3. *Contamination of wells from sewage-polluted river water.*—So far as I was able to ascertain there are only a few wells which could possibly be affected by the change of conditions in the river, and the sections within which these wells are located are now supplied with city water. Therefore, should contamination of these wells follow as a result of the dam, it does not appear that their abandonment would be a very weighty consideration in comparison with the desirable objects to be accomplished by the dam. It is possible that when the water level in the river has been raised by the dam the river water may find its way through crevices or pervious strata to wells which it does not now reach. The likelihood of such contamination of wells in the vicinity occurring in this way could be determined only by a thorough geological investigation, or by a comparative study of the water in the wells before and after the dam is constructed.

All of the evils apprehended as likely to arise as a result of the dam could be entirely obviated by the construction of intercepting or trunk sewers, which would discharge the sewage from Minneapolis and St. Paul into the river at points below the site of the dam; and the likelihood of such evils arising could be markedly lessened by screening the sewage which is discharged into the river above the site of the dam.

In view of the foregoing, Dr. Lumsden, in his report, presented the following conclusions:

1. It appears highly improbable that until the pollution of the river above the site of the proposed dam has become much greater than it is now the effect of the dam will be such as to give rise to a condition of nuisance in the water immediately above the dam; and if the damming up of this water does not cause a concentration of sewage to such a degree that putrefaction with the exhalation of markedly offensive gases will occur, it is not reasonable to believe that such effluvia as arise from the body of water above the dam will be detrimental to the health of persons in the vicinity.

2. The sewage pollution, the flowage, and the discharge of the river being determinable now, the predetermination of the effect of the dam on offensive putrefaction in the water and on the discharge from sewers entering the river above the dam seems to be entirely within the scope of the science of engineering.

3. Dangerous pollution of certain wells in the vicinity of the dam as a result of the increased height of the water in the river appears improbable; and could such a result be foreseen, the abandonment of these wells would not seem to constitute a reasonably sufficient objection to stand in the way of having the dam constructed.

Mine Sanitation.

Scientific observers in foreign countries have noted among certain mining populations an unusual prevalence of hookworm, tuberculosis, and other communicable diseases. The importance of investigating the sanitary conditions under which miners live may be realized from the fact that among the great numbers of persons connected with these industries in the United States, a large percentage is of foreign birth, and that undetected disease carriers may import their infections into the mines, and through the migratory habits of the miners these infections may be spread to different sections of the country.

Therefore, when the bureau, November 22, 1910, received an invitation from the director of the newly created Bureau of Mines to detail an officer of the service to one of the mine-rescue cars then in the coal fields, an opportunity for investigation was offered. Passed Asst. Surg. W. C. Rucker was ordered to join mine-rescue car No. 6, for the purpose of conducting sanitary investigations in the different localities visited in West Virginia, being especially instructed to observe the prevalence of contagious and infectious diseases among the miners, the causes for such prevalence, and the danger of their spread through interstate traffic. His detail extended from January 14 to February 9, when the pressure of other business necessitated his recall to the bureau.

Eighteen mining towns were visited and at each observations were made by Dr. Rucker as to the general sanitary conditions, and whenever opportunity offered the interior of the mines was inspected. Short addresses on public-health topics, such as hookworm disease, tuberculosis, typhoid fever, camp sanitation, and infant mortality were delivered in 12 different towns, at the request of the engineer in charge of the car.

To ascertain the prevalence of hookworm disease Prof. C. W. Stiles, of the Hygienic Laboratory, was detailed to succeed Dr. Rucker on the mine-rescue car. On account of other duties he was unable to join the car until May 9, his stay lasting until May 25. Hookworm infection was found microscopically in most of the places visited. Several infections of Cochin China diarrhea were also studied in one of the localities. From a scientific viewpoint, the most important point established was that Cochin China worms develop in mines, although the temperature be only 55° F. It is expected that this work will be resumed, as several important points remain to be studied. On completion the data will be incorporated in a final report.

A number of problems relating to the hygiene of mines and the mine industry, both from a scientific and administrative viewpoint, are to be worked out. Of these, one is the prevalence of lung diseases among miners and the measures necessary to prevent them.

In a letter of May 3, 1911, received from the secretary of the National Association for the Study and Prevention of Tuberculosis, attention was invited to the following resolutions adopted by the unanimous vote of the board of directors of that association:

> Whereas the royal commission appointed by the governor general of Australia to inquire into the subject of miner's lung diseases has ascertained a truly alarming state of affairs, resulting from the extensive use of rock drills under ground, not provided with spraying apparatus to diminish the production of health-injurious dust; and
>
> Whereas a large proportion of our mining population are exposed to conditions quite similar to those reported upon adversely in the Australian Commonweath; and
>
> Whereas the actual extent of the occurrence of lung diseases among metal miners in the United States is at present unknown:
>
> *Resolved by the board of directors of the National Association for the Study and Prevention of Tuberculosis,* That we recommend to the President and the Congress of the United States that a thorough investigation into the whole subject of the sanitary conditions surrounding metal mining under ground, with special reference to diseases of the lungs, be made by the United States Bureau of Mines, the Public Health and Marine-Hospital Service, and the appropriate State authorities.

In the meantime a communication of May 12 from the Secretary of the Interior had been received by the Secretary of the Treasury, in which a formal request was made for the cooperation of the Public Health and Marine-Hospital Service with the Bureau of Mines by the detail of one or more service officers who would give advice regarding sanitary and medical matters, and make investigations of hygienic conditions of mines and the influence of poisonous gases. In a reply addressed to the Secretary of the Interior on May 20 assurance was given of the desire of the bureau and department to cooperate in the manner indicated, reference was made to the above-mentioned resolutions, and in view of the importance of the subject it was suggested that investigations could be begun immediately. At a conference with the Director of the Bureau of Mines, it was decided that, in order to make the cooperation between the two bureaus effective at once, an officer should be detailed for duty on the mine-rescue car having its headquarters at Pueblo, Colo. Asst. Surg. S. C. Hotchkiss was selected for this duty, and in his orders of June 5, 1911, directions were given to make thorough investigations of those conditions of the mining industry affecting the public health, particularly with reference to the prevalence and cause of lung diseases among miners.

Asst. Surg. Hotchkiss joined the car on June 24 at Glenwood Springs, Colo., and has since that date been engaged in the work outlined above. As the investigation proceeded and new aspects were observed, it became necessary to authorize Dr. Hotchkiss to leave the car and work independently at such times as it was found impracticable to pursue his work to the best advantage if remaining on the car. This action became otherwise imperative in view of necessary repairs to the car and the little prevalence of diseases of the lungs in the coal-mining district visited. Dr. Hotchkiss finally left the mine-rescue car on July 31, since that date being engaged in a sanitary survey of metal mines in different parts of Colorado. He has collected valuable data, both statistical and otherwise, which, after proper classification and preparation, will be issued in printed form.

SUPERVISION OF VIRUSES, SERUMS, TOXINS, AND ANALOGOUS PRODUCTS.

Under the act of July 1, 1902, governing the propagation and sale in interstate traffic of viruses, serums, toxins, and analogous products, there were inspected 24 establishments, 21 of which were relicensed and 3 granted new licenses. The license of one establishment for vaccine virus was not renewed, and of foreign establishments one was refused a license for this product and another for tuberculin.

Following is a list of the establishments holding licenses on July 1, 1911:

No. of license.	Establishments.	Products.
1	Parke, Davis & Co., Detroit, Mich.	Diphtheria antitoxin, antigonococcic serum, antistreptococcic serum, antitetanic serum, antituberele serum, bacterial vaccines, erysipelas and prodigiosus toxines (Coley), tuberculins, and vaccine virus.
2	H. K. Mulford Co., Philadelphia, Pa.	Diphtheria antitoxin, antidysenteric serum, antigonococcic serum, antimeningococcic serum, antipneumonic serum, antistreptococcic serum, antitetanic serum, tuberculins, vaccine virus, bacterial vaccines, normal horse serum, and rabies virus.
3	Dr. H. M. Alexander & Co., Marietta, Pa.	Diphtheria antitoxin, antirabic virus, tuberculins, vaccine virus, and normal horse serum.
5	Fluid Vaccine Co., Milwaukee, Wis.	Vaccine virus.
8	The Cutter Laboratory, Berkeley, Cal.	Diphtheria antitoxin, antistreptococcic serum, tuberculins, bacterial vaccines, and vaccine virus.
9	Frederick Stearns & Co., Detroit, Mich.	Diphtheria antitoxin, streptolytic serum, and pneumolytic serum.
11	Pasteur Institute of Paris, Paris, France	Diphtheria antitoxin, antidysenteric serum, antimeningococcic serum, antiplague serum, antistreptococcic serum, serum antivenimeux, antitetanic serum, and antiplague vaccine.
12	Chemische Fabrik auf Actien, Berlin, Germany.	Diphtheria antitoxin and antistreptococcic serum.
14	Health department of the city of New York.	Diphtheria antitoxin, antitetanic serum, antirabic virus, vaccine virus, tuberculin, and antimeningococcic serum.
15	Dr. W. R. Hubbard Serum Laboratory, Detroit, Mich.	Diphtheria antitoxin.
16	National Vaccine and Antitoxin Institute, Washington, D. C.	Diphtheria antitoxin, antigonococcic vaccine, vaccine virus, normal horse serum, antistaphylococcic vaccine and antistreptococcic vaccine.
17	Lederle Antitoxin Laboratories, New York City.	Diphtheria antitoxin, antistreptococcic serum, antitetanic serum, suspension of lactic acid bacilli, vaccine virus, and antityphoid vaccine.
18	Burroughs, Wellcome & Co., London, England.	Diphtheria antitoxin, antigonococcic serum, antidysenteric serum, anticolonbacillus serum, antistaphylococcic serum, antistreptococcic serum, antityphoid serum, tuberculins, and bacterial vaccines.
19	Memorial Institute for Infectious Diseases, Chicago, Ill.	Diphtheria antitoxin.
21	Swiss Serum and Vaccine Institute, Berne, Switzerland.	Diphtheria antitoxin, antidysenteric serum, antimeningococcic serum, antipneumonic serum, antiplague serum, antistreptococcic serum, tuberculins, anticholera vaccine, antiplague vaccine, antityphoid vaccine, and antitetanic serum.
22	Institut Bacteriologique Lyon, Lyons, France.	Antidiphtheric serum and normal goat serum.
23	Bacterio - Therapeutic Laboratory, Asheville, N. C.	Tuberculins.
24	Farbwerke, vormals Meister Lucius und Brüning, Hoechst-on-Main, Germany.	Diphtheria antitoxin, antidysenteric serum, antimeningococcic serum, antipneumonic serum, antistreptococcic serum, antitetanic serum, and tuberculins.
25	Tuberculin Society of St. Petersburg, St. Petersburg, Russia.	Tuberculinum purum.
27	Institut Pasteur de Lille, Lille, France.	Serum antivenimeux.
28	Bacteriologisches Institut Lingner, Dresden, Germany.	Pyocyanase.
29	The Behringwerk, Marburg, Germany.	Antitetanic serum and tuberculin.
30	Dr. G. H. Sherman, Detroit, Mich.	Bacterial vaccines.
31	E. Merck, Darmstadt, Germany	Antidiphtheric serum, antimeningococcic serum, antipneumonic serum, antistreptococcic serum, normal horse serum (dried), and normal horse serum.
32	Kalle & Co., Biebrich, Germany.	Tuberculin (Rosenbach).
33	American Biologic Co., Kansas City, Mo.	Antirabic virus.
34	The Beraneck Laboratory, Neuchatel, Switzerland.	Tuberculin (Beraneck).
35	Dr. Carl Spengler, Davos-Platz, Switzerland.	I. K. immune blood.

The question of licensing foreign establishments for the importation and sale of vaccine virus was given careful consideration, and with the approval of the Secretary of the Treasury no licenses were issued to foreign firms for the importation of this product. There can be no doubt of the possible danger of the introduction of foot-and-mouth disease through vaccine virus, since it has been definitely proven that two outbreaks of foot-and-mouth disease in the United States originated in this manner. On account of the impracticability of inspectors of foreign establishments determining absolutely the freedom of vaccine animals from this disease and because of the impossibility of securing at all times animals immune to vaccine virus with which to test imported samples of vaccine for foot-and-mouth disease, it is undesirable that vaccine virus should be imported. Recommendation to this effect was accordingly made and approved by the department.

The preparation and distribution of the standard units for antitetanic and antidiphtheric serums was continued as in previous years. These units continue to give entire satisfaction.

The examination of viruses, serums, toxins, and analogous products bought in open market to determine whether the products as found on the market are properly labeled to conform in every respect to the law has been seriously interfered with during the past year on account of the insufficiency of the appropriation for the maintenance of the laboratory. It has been found possible to purchase only a few samples for examination. The purchase of samples in open market and their subsequent examination in the laboratory constitute one of the most important means by which an efficient control is exercised over the firms manufacturing these important therapeutic products.

In a letter of October 14, 1910, Dr. Eugene H. Porter, commissioner of health of New York, invited attention to a report by Dr. G. S. Towne, of Saratoga Springs, N. Y., to the effect that a case of tetanus had occurred in that city following vaccination.

Through the courtesy of Drs. Porter and Towne a sample of the virus used was received and tested subsequently at the hygienic laboratory in order to determine the presence or absence of tetanus organisms. The results of the investigation were negative as to the presence of tetanus spores in the virus.

The long period elapsing between the date of vaccination and the onset of symptoms (22 days) in this case and the fact that five children were vaccinated from the same package of virus, only one of whom suffered any ill effects from vaccination, render it out of the question that the infection in this one case was caused by the contamination of the virus.

In a letter of January 4, 1911, the director of the hygienic laboratory invited the attention of the bureau to the fact that a number of manufacturers of biological products, apparently on account of unfamiliarity with the provisions of the act of July 1, 1902, were neglecting to comply with that part of section 1 which requires each package of virus, serum, etc., to bear the date beyond which the contents can not be expected beyond reasonable doubt to yield specific results.

A letter was, therefore, immediately prepared and sent to each licensed manufacturer in the United States calling attention to this omission and the necessity of labeling their products in strict accordance with the provisions of the law.

Responses were subsequently received from all the establishments expressing their intention to so label their products.

RESTRICTION OF SALE OF CERTAIN CLASSES OF MILK IN THE TREASURY BUILDING AND ITS ANNEXES.

Investigations of typhoid fever in the District of Columbia in 1906–1908 by a board of officers of this service showed that about 10 per cent of the cases studied during the three years were definitely attributed to infected milk, and studies of the occurrence of the tubercle bacilli in the market milk of Washington showed that 6.72 per cent of 223 samples examined contained sufficient tubercle bacilli to cause typical tuberculosis in inoculated animals. Other studies of milk showed that this product is capable of being the agent of transmission of the infections of diphtheria and scarlet fever.

The above facts indicate that all reasonable efforts should be made to protect the health of Government employees, and the matter was submitted for the consideration of the Secretary of the Treasury, with the recommendation that an order be issued forbidding the sale of certain classes of milk in the Treasury Building and its annexes. The memorandum submitted was used as the basis of the following circular letter issued February 6, 1911:

FORBIDDING SALE OF CERTAIN CLASSES OF MILK IN THE TREASURY BUILDING AND ITS ANNEXES.

[Circular letter No. 15.—Chief clerk.]

TREASURY DEPARTMENT, OFFICE OF THE SECRETARY,
Washington, February 6, 1911.

To officers and employees of the Treasury Department:

Data now in possession of this department show unquestionably the danger involved to the public health in the use of milk not produced and handled in accordance with approved sanitary requirements. In order therefore to put to practical use the conclusions reached by sanitary authorities in regard to safe milk, it is hereby ordered that no milk shall be sold or offered for sale within the Treasury Building or any of its annexes (including the Bureau of Engraving and Printing) in the District of Columbia which does not conform to one of the three classes—certified milk, inspected milk, or pasteurized milk—defined in Bulletin No. 56 of the Hygienic Laboratory of the Bureau of Public Health and Marine-Hospital Service.

Determinations as to the standards of milk shall, when necessary, be made at the hygienic laboratory, Public Health and Marine-Hospital Service.

All vendors of milk, before offering their product for sale within the Treasury Building or any of its annexes, shall first obtain a written permit from the chief clerk of the department, and in case of the Bureau of Engraving and Printing such permit shall be obtained from the director of that bureau.

Heads of bureaus, chiefs of divisions, and other officers of the Treasury Department will be expected to enforce the provisions of this circular and to promptly report any violations thereof to the chief clerk.

FRANKLIN MACVEAGH, *Secretary.*

[Transcript from Hygienic Laboratory Bulletin No. 56.]

CLASS 1. *Certified milk.*—The use of this term should be limited to milk produced at dairies subjected to periodic inspection and the products of which are subjected to frequent analyses. The cows producing such milk must be properly fed and watered, free from tuberculosis, as shown by the tuberculin test and physical examination by a qualified veterinarian, and from all other communicable diseases, and from all diseases and conditions whatsoever likely to deteriorate the milk. They must be housed in clean, properly ventilated stables of sanitary construction, and must be kept clean. All persons who come in contact with the milk must exercise scrupulous cleanliness and must not harbor the germs of typhoid fever, tuberculosis, diphtheria, or other infections liable to be conveyed by the milk. Milk must be drawn under all precautions necessary to avoid infection and be immediately strained and cooled, packed in sterilized bottles, and kept at a temperature not exceeding 50° F. until delivered to the consumer. Pure water, as determined by chemical and bacteriological examination, is to be provided for use throughout the dairy farm and dairy. Certified milk should not contain more than 10,000 bacteria per cubic centimeter and should not be more than 12 hours old when delivered. Such milk should be certified by public health officers or by some other properly constituted authority.

CLASS 2. *Inspected milk.*—This term should be limited to clean raw milk from healthy cows, as determined by the tuberculin test and physical examination by a qualified veterinarian. The cows are to be fed, watered, housed, and milked under good conditions, but not necessarily equal to the conditions prescribed for class 1. All persons, who come in contact with the milk, must exercise scrupulous cleanliness and must not harbor the germs of typhoid fever, tuberculosis, diphtheria, or other infections liable to be conveyed by the milk. This milk is to be delivered in sterilized containers and is to be kept at a temperature not exceeding 50° F. until it reaches the consumer. It should contain not more than 100,000 bacteria per cubic centimeter.

CLASS 3. *Pasteurized milk.*—Milk from dairies which do not comply with the requirements specified for classes 1 and 2 should be pasteurized before being sold, and should be sold under the designation "pasteurized milk." Milk for pasteurization should be kept at all times at a temperature not exceeding 60° F. while in transit from the dairy farm to the pasteurizing plant, and milk after pasteurization should be placed in sterilized containers and delivered to the consumer at a temperature not exceeding 50° F.

All milk of unknown origin should be placed in class 3 and subjected to clarification and pasteurization. No cow in any way unfit for the production of milk for use by man, as determined upon physical examination by an authorized veterinarian, and no cow suffering from a communicable disease should be permitted to remain on any dairy farm on which milk of class 3 is produced, except that cows which upon physical examination do not show physical signs of tuberculosis may be included in dairy herds supplying milk of this class.

This milk is to be clarified and pasteurized at central pasteurizing plants, which should be under the personal supervision of an officer or officers of the health department. These pasteurizing plants may be provided either by private enterprise or by the municipality, and should be located within the city.

By the term "pasteurization," as used herein, is meant the heating of milk to a temperature of 150° F. or 65° C. for 20 minutes, or 160° F. or 70° C. for 10 minutes, as soon as practicable after milking, in inclosed vessels, preferably the final containers, and after such heating immediate cooling to a temperature not exceeding 50° F. or 10° C.

Other conditions.—No milk should be regarded as pure and wholesome which, after standing for two hours or less, reveals a visible sediment at the bottom of the bottle.

No dairy farm should be permitted to supply milk of a higher class than that for which its permit has been issued, and each dairy farm supplying milk of a specified class should be separate and distinct from any dairy farm of a different class. The same owner, however, may supply different classes of milk, providing the dairy farms are separate and distinct.

The term "milk" as herein used includes cream.

INVESTIGATION OF A MECHANICAL DEVICE AS AN AID TO RESPIRATION.

In a communication of September 1, 1910, the General Superintendent of the Life-Saving Service, stated that the board on life-saving appliances, connected with his service, had, in its report on the Draeger pulmotor, made the following recommendation:

> The board does not feel authorized to pass upon a subject involving such important consequences without the advice and support of high medical authority,

> and since the apparatus has been left in the hands of the board and is available for trial and experiment, the board respectfully recommends that the general superintendent request the Surgeon General of the Public Health and Marine-Hospital Service to have this device examined and tested in such manner as he may deem necessary, and to favor the Life-Saving Service with his opinion and report to guide the board in its further deliberations upon the subject.

The superintendent expressed himself as concurring in the opinion of the board, and requested that examinations and tests of the Draeger pulmotor be undertaken by this bureau, in order to determine the merits of this apparatus in the resuscitation of apparently drowned persons.

A reply was sent to the General Superintendent of the Life-Saving Service, informing him that the chairman of the bureau sanitary board had been directed to convene a meeting of the board with a view to considering the usefulness of the Draeger pulmotor for the purposes mentioned. A consideration of the apparatus by the board convinced its members of the necessity of conducting a number of laboratory experiments in order to have the efficiency of the apparatus properly tested, and the Director of the Hygienic Laboratory was therefore directed to have such tests made in the Division of Pharmacology as would throw light on the advantages and limitations of the Draeger pulmotor in the resuscitation of persons apparently drowned.

The investigations were conducted at the Hygienic Laboratory by Dr. W. H. Schultz, of the Division of Pharmacology, and after due consideration of his report, and demonstrations of the apparatus by a representative of the manufacturing company, the sanitary board came to the following conclusions, which were embodied in a letter sent subsequently to the General Superintendent of the Life-Saving Service:

> The demonstrations made of the Draeger pulmotor show that it is an ingenious device, and reports of the tests made with it show that it has features to recommend it as a means of artificial respiration under certain conditions, and that on the other hand, it would have decided limitations which would apply particularly when used for the resuscitation of apparently drowned persons.
>
> The manipulation suggested by Howard, Sylvester, Schaefer, Kelley, and others, when used in connection with other means intended to conserve the bodily temperature and bring about stimulation, are the essential measures thus far known for the resuscitation of apparently drowned persons, and the same effect can not be produced by any mechanical device known to the officers who were designated to study this question. It would appear, however, that the use of the Draeger pulmotor would admit of the use at the same time of the above-mentioned measures, but it remains to be determined what the real value of this apparatus would be under these conditions, and this can only be done by actual tests made on persons apparently drowned.
>
> Experiments on drowned animals in the Hygienic Laboratory showed that, on account of the relaxed condition of all muscles involved in the normal respiratory reflexes, the pulmotor, instead of inflating the lungs, sends oxygen into the oesophagus and stomach. In experiments with normal dog lungs, chest open, it was found that the pressure of the pulmotor was hardly sufficient to completely inflate them. In the case of drowned dogs, it was found that the lungs are difficult to inflate, and even when a canula was placed in the trachea, only the basal portion of the lungs seemed to be aerated by the use of this apparatus.
>
> These statements are made only in relation to the use of the pulmotor in the resuscitation of apparently drowned individuals.
>
> When the nasal passages are normal, and the musculature of the respiratory apparatus possesses sufficient tonus and irritability to respond to the proper reflexes, this instrument appears to have positive advantages over ordinary

methods of respiration; for instance, in suffocated individuals with broken arms, ribs, or severe internal injuries, in cases of collapse under chloroform anaesthesia, or when it is necessary to give artificial respiration in a vitiated atmosphere.

INQUIRY INTO THE TRANSMISSION OF LABORATORY SPECIMENS THROUGH THE MAILS.

The campaign against hookworm disease, conducted generally throughout the South, has rendered it necessary to have specimens of feces sent frequently, through the mails, for examination at laboratories.

On November 2, 1910, a communication was received from the Second Assistant Postmaster General, inquiring (1) whether the admission of specimens of feces infected with hookworm disease would be in violation of paragraph 2, section 495, Postal Laws and Regulations, and (2) whether such specimens could be transmitted through the mails without danger to the health of postal employees or the public. A sample of a mailing device submitted to the Post Office Department was forwarded to the bureau for consideration in connection with the use of the mails for shipping specimens of feces.

The question was carefully considered in its various aspects by the bureau, and in response to his first question the Second Assistant Postmaster General was informed that the specimens of feces from patients with hookworm disease could not be classified as cultures of microorganisms, and therefore, the mailing of them would not be a violation of paragraph 2, section 495, of the Postal Laws and Regulations. He was also informed that the transmission of specimens of feces through the mails in single mailing cases such as the one forwarded, would be without danger to the postal employees or the public in so far as infection with hookworm disease was concerned. In view of the danger involved, however, that some of these specimens might be from "typhoid bacillus carriers," the opinion was expressed that all mailing cases containing specimens of feces should be placed in additional containers, prior to admission to the mails, in accordance with paragraph 4, section 495, Postal Laws and Regulations.

NATIONAL LEPROSY INVESTIGATION STATION.

The operations of the Leprosy Investigation Station have been continued and a definite plan for future studies outlined. On account of limitations of the appropriation for the maintenance of the station during the fiscal year 1911, and because of local conditions, these plans provided that the major portion of the investigations should be conducted at the Kalihi receiving station on the island of Oahu.

As stated in a previous report, it became apparent soon after studies of leprosy were inaugaurated that investigations of incipient cases were absolutely necessary to success, and these investigations could only be conducted at the receiving station and the homes of patients themselves. Prior to April, 1909, all lepers, on being apprehended, were sent to the territorial leper colony on the island of Molokai, but on April 14, 1909, an act was passed by the territorial legislature, section 1 of which provides for the establishment of a hospital on the island of Oahu for the care of persons afflicted with leprosy, and section 6 of the same law reads as follows:

> Any leper may be removed from such hospital, or any other place, to the leper settlement at any time, with his consent, but no leper shall be so removed until he has been at such hospital for at least six months, unless in the opinion of at least three licensed physicians he can not be materially benefited by further treatment there.

The effect of this act is to detain at the hospital all incipient cases apprehended, and entirely preclude the possibility of the study of early cases on the island of Molokai.

The field for investigations of leprosy was therefore transferred from the island of Molokai to the Kalihi receiving station and other foci of the disease in the islands, and it was found that the cost of carrying on these investigations would be thereby reduced.

Passed Asst. Surg. D. H. Currie, the director of the station was accordingly authorized at the beginning of the fiscal year to limit operations at the hospital station on Molokai, and to transfer his scientific and laboratory staff to Kalihi where the work would be pursued in buildings furnished by the Territory of Hawaii. He was also authorized to care for such patients afflicted with leprosy as might be committed to his care by the Board of Health of Hawaii, the expenses of their quarters, food, nursing, and general care being borne by the Territory. This arrangement has proven very satisfactory. Incipient cases are made available, competent employees are secured with increased facility, and it is possible to conduct the investigations with greater economy.

The station records are kept at the hospital station on Molokai, the correspondence is conducted from there, and it is otherwise utilized as a depot of operations. During the year, the only improvement and repairs were those absolutely necessary, the chief item of which was the glazing in of the porches of the officer's quarters, together with miscellaneous painting and minor repairs to buildings.

At the close of the fiscal year the equipment of the station was adequate, and the director states that the only additional apparatus that will be required in the immediate future is such as may be needed to replace broken and worn out articles, or such as may be used in the performance of some special work which can not at present be foreseen. The former assistant director, Dr. Walter R. Brinckerhoff, having resigned April 15, 1910, Mr. Moses T. Clegg was appointed assistant director, October 14, 1910. This officer's work previous to his appointment was well known to the scientific world. He had done much original research, especially in relation to cholera and amebic dysentery, and it was he who first succeeded in cultivating the bacillus of leprosy in symbiosis with amebæ and cholera vibrios, and later isolated it in pure culture. This work was first performed in the Bureau of Science at Manila, and he has continued it together with much other original work since joining the leprosy investigation station. This was the only important change in the personnel of the station during the fiscal year 1911.

The act of March 3, 1905, providing for the investigation of leprosy with special reference to the care and treatment of lepers in Hawaii provided for increased compensation for medical officers assigned to that duty, but the provisions of section 7 of the law as to compensation applied only to those officers stationed at the leprosarium on the island of Molokai. It was the evident intent that the increased compensation should be granted in view of qualification for such research work and the dangers of those associated with this disease, but a decision of the Comptroller of the Treasury of November 30, 1910, held that officers though engaged in investigations of leprosy as provided for by law were not entitled to increased compensation unless actually on duty at the leprosy hospital on Molokai. On account of the difficulty of securing officers to continue the investigations of leprosy at Kalihi and other foci of the disease in the islands, recommendations were made to Congress, and provision was made in the act making appropriations for sundry civil expenses that section 7 of the act of March 3, 1905, as to compensation shall apply to said officers while engaged in investigations of leprosy at Kalihi and other places in Hawaii.

PROGRESS OF SCIENTIFIC INVESTIGATIONS OF LEPROSY.

Soon after the beginning of the fiscal year 1911 the workers at the leprosy investigation station succeeded in growing the bacillus of leprosy in symbiosis with cholera and amebæ, and afterwards isolating it in pure culture, thus confirming the work of Clegg before he had been appointed assistant director. The results of these investigations were published in the Public Health Reports August 26, 1910. This work was the first published confirmation of Clegg's results, but since the date mentioned Duvall in New Orleans, working independently, also confirmed Clegg's work, so that there now remains little doubt in the minds of scientists that the organism grown by Clegg is the bacillus of leprosy.

The successful cultivation of the bacillus of leprosy may be fairly considered as the first great advance made in the scientific investigation of the disease since Hansen first announced in 1868 the finding of lepra bacilli in the tissues of leprous individuals. Although Hansen confirmed his announcement in 1877 and subsequently, no person had succeeded in growing this organism on artificial media until the successful work of Clegg in 1909.

Up to July 1, 1911, there had been isolated at the leprosy investigation station seven "strains" of bacillus lepræ in pure culture, and these are being continued at the laboratory at Kalihi. Subcultures of these organisms have been received at the Hygienic Laboratory in Washington, so that should any accident destroy the original cultures, the subcultures would be available for continued study.

After the isolation of the organism in pure culture, attempts were made to inoculate laboratory animals, a feat which had been attempted many times with leprous tissue, but without definite results; the nearest approach to infection of animals having been made by Nicolle with resulting production of nodules at the sites of inoculation in certain species of monkeys. A large number of animals have been inoculated, including monkeys, guinea pigs, rabbits, white rats, and a horse. Of these one monkey developed local leprosy, and this result may be compared to that obtained by Nicolle. Another monkey inoculated intraperitoneally developed four leprous nodules, one on the cheek and three on the abdomen, accompanied by atrophy of the skin in the supraorbital region, and by more or less general alopecia. Leprosy bacilli could be demonstrated in these lesions, and the director states that there is absolutely no doubt that the animal was successfully inoculated. None of the other laboratory animals mentioned have developed the disease, although local nodules, which soon soften and discharge by abscess formation, are commonly produced. As similar lesions can be produced by killed cultures of other acid-fast organisms, not ordinarily considered pathogenic, the officers interested do not believe that such lesions are evidence of true infection, but rather that the latter is a peculiar effect of the acid-fast fat, which is found to exist in all the organisms of this group, and similar lesions have been produced by the use of filtered solutions of these fatty substances.

Immediately upon isolating the first pure culture of the leprosy bacillus, there was prepared at the leprosy investigation station a vaccine by suspending the bacilli in normal salt solution and killing them at 60° C. This preparation was standardized and used to some extent, but its use discontinued on account of slowness of absorption and local reaction.

A glycerin extract of the organism isolated in pure culture was also prepared and filtered, thus freeing it from bacillary bodies. This substance, which was termed "lepratoxine," was used in its original form and subsequently modified and used with at first apparent improvement, but after it had been continued for several months the condition of the patients became stationary and has remained so.

It has been noted in the use of many substances in the treatment of leprosy, and especially those of biologic nature which are injected hypodermatically, that general reactions followed by temporary improvement occur, but that this improvement is not continuous. The explanation of this phenomenon, in our present state of knowledge, can not be given with certainty, but, according to Currie, it is apparently associated in some way with the stimulation of cellular activity, produced by the reaction of the body to certain foreign substances as unlike in character as tuberculin, horse's serum and "lepratoxine." In his report Currie states that he is therefore at present not inclined to believe, as was the case at first, that such reactions and temporary improvement constitute any evidence of the specificity of the substance employed. It is natural that one having tuberculin and tuberculosis in mind, should at first sight look upon such reactions as evidence that a specific substance was being employed, and it is this view, in Currie's opinion, that has led to most of the claims of cures for leprosy in the use of biologic products, all of which claims, however, have later been disproven.

Attempts at active immunization of lepers not having proved as satisfactory as had been hoped, attention was turned to the possibility of producing a passive immunity by the administration of the serum of an immunized horse. With this in view, an animal was given progressively increasing doses of live lepra bacilli in the jugular vein. After continuing these efforts to immunize the horse for a period of several months, some of its serum was collected. This serum agglutinates cultures of the lepra bacilli in a dilution as high as 1:1000. Considering the short time that this animal has been receiving injections, this agglutinating power of the serum appears to be encouraging, as no analogous result has ever been obtained in the case of tubercle bacilli, and it leads to the hope that, if agglutins can be produced thus easily, there may be produced a serum of strong bactericidal power, and when report was made, this serum had reached a point where it would kill lepra bacilli cultures in a dilution of 1:40, while cholera spirilla, used as controls, escaped destruction when exposed to the action of the serum.

Repeated doses of 40 to 50 cubic centimeters were administered to two patients, but up to the time report was made, neither of these patients showed improvement. The agglutinating properties of the serum are so encouraging, however, that it is the intention to devote a considerable amount of time and effort to work of this character during the coming fiscal year.

In addition to the above work, a careful study has been made of the cultural peculiarities of the lepra bacilli which were isolated, and it was found that in every respect cultures isolated in Manila and cultures isolated in Honolulu resemble each other and are apparently identical.

During the last few months attempts have been made at the station to determine by means of complement fixation the possibilities of identifying the organisms definitely. Satisfactory results would not only demonstrate positively that the bacillus isolated is B. leprae, but might lead to diagnoses in the early stages of the disease. Such a result would, of course, have great practical bearing on the eradification of leprosy, by permitting an early isolation of the cases, and it might also be the means of indirectly throwing light on transmission. The failure to secure satisfactory results with other acid-fast bacilli in complement fixation tests is not very encouraging, but it is intended to carry on this work until some definite conclusion is reached.

During the fiscal year Currie observed and reported that the disease known as rat leprosy was, in his experience, often primarily a pneumonia, accompanied by septicemia, and later nodular and atrophic skin lesions developed in the affected rodents, which latter lesions resembled in many respects the lesions in human leprosy. In his report he states that experiments have been carried to a point that confirm these first observations, and that at least in the case of the "strain" of rat lepra bacilli used, rats infected either subcutaneously or by natural contact, first develop a broncho-pneumonia with septicemia, which lesions precede the skin manifestations for a period of weeks or longer.

The work of securing titles covering the literature of leprosy, and indexing same, has progressed rapidly during the fiscal year. As soon as this work shall have been completed it is the intention to make a copy of these titles, with their references for publication as a bulletin of the service. Such a publication would be of great benefit to future workers.

Several articles are now in course of preparation, covering the work that has been done during the fiscal year which are intended for early-date publication.

During the year the staff of the Leprosy Investigation Station has cooperated in every possible way with the Territorial health authorities, not only in the work of leprosy investigation and treatment, but when called upon by said authorities, the officers have attended necropsies, examined specimens, slides, etc., and during the two cholera outbreaks of last spring, all possible assistance was rendered the local authorities in the diagnosis of the suspected cases that were brought to the morgue for necropsy, and many specimens of suspected foodstuffs and water were examined for the spirillum of cholera. In the second outbreak, under authority from the bureau, granted in compliance with the request of the governor of the Territory, the whole laboratory force of the station was employed for a period of a week in investigating the source of the cholera infection. This investigation was successful in demonstrating the source from which the cases had received their infection, and the preventive measures of the board of health were based upon the recommendations made after the said investigation. These measures succeeded in promptly stamping out the disease, no case of cholera having developed from five days after the recommendations were put into force up to the close of the year.

The cooperation of the Territorial authorities, on the other hand, has been of the greatest service to the station, and during the past year they not only supplied all the clinical material requested, but provided at Kalihi additional room for laboratory work.

HYGIENIC LABORATORY.

In addition to the scientific value of the research work of the Hygienic Laboratory, its operations are intimately related to the work of the service as a whole, and the results are of practical value in the conduct of the administrative offices. This is illustrated in the foregoing pages. It remains to make mention of certain work performed in the regular operations of the laboratory divisions and to call attention to the organization and needs of the laboratory as a whole.

Personnel.—The personnel attached to the laboratory at the end of the fiscal year consisted of the director, the assistant director, the professors of zoology, pharmacology, and chemistry, respectively, 11 commissioned medical officers, 2 pharmacists, 8 technical assistants, an artist, a special expert in pathology, an acting librarian, and 27 attendants, making a total of 56. This is the largest number connected with the laboratory in any fiscal year.

The time has come when a sanitary engineer should be included in the laboratory personnel. The officers attached to the laboratory who have had to investigate outbreaks of various diseases, particularly typhoid fever, have always felt the need of this kind of professional assistance. The difficulty has been to find for nomination an engineer specially qualified for the peculiar duties of the position, but it is thought possible, and efforts will be continued to recommend for appointment a sanitary engineer who will be able to give expert advice upon sanitary engineering problems, to do research work along the same lines and to prepare manuscript for publication showing this important phase of the public-health problem.

During the year representatives of the Vermont, Virginia, North Carolina, and South Carolina State Boards of Health and of the Richmond city board of health received instruction in particular subjects in which they were interested.

Two medical officers of the Government Printing Office were given a course of instruction.

A number of commissioned officers of this service were given special instruction in the bacteriological diagnosis of cholera.

The director in his report invites attention to the difficulty the laboratory has in retaining the services of certain attendants. During the year a number have resigned who had acquired valuable experience and reached a high degree of efficiency in certain lines of work. These resignations have all been prompted by the fact that the compensation was not sufficient.

The duties performed by many of these attendants are of a particularly hazardous nature, in that they have to care for animals suffering from dangerous diseases, such as rabies, tuberculosis, and bubonic plague, and unless extreme care is exercised by all concerned the result might be serious. One attendant, through no fault of his own, was exposed to the infection of rabies on two occasions, necessitating the administration of antirabic treatment. It will be necessary to recommend increase of compensation for certain attendants and also to nominate two additional ones on account of the increased amount of work.

Buildings and grounds.—On account of the increase in scope of the investigations being pursued in the laboratory, the present building, in spite of the addition occupied about two and a half years ago, is now no longer adequate. The necessity of an additional building for research work, disinfection experiments, and housing of animals, to which allusion is made in the annual report for 1910, is urgent, not alone on account of the condition of the present frame buildings now used in part for this work, but on account of the need of providing space for the housing and isolation of animals under experiment and suffering from dangerous communicable diseases.

During the past year there have been under investigation, among others, the three following diseases: Typhus fever, poliomyelitis, or infantile paralysis; and measles. In order to safeguarde the health of the personnel of the laboratory, and for the successful pursuance of the investigation of these diseases, it is essential that animals under experiment should be strictly isolated one from the other. The present accommodations are not sufficient to do this in a manner satisfactory or on a scale that will result in the best work.

The recommendation is therefore renewed for a new building at the Hygienic Laboratory, to be used for research work, disinfection experiments, and housing of animals, and for this purpose there has been included in the estimates the sum of $25,000.

The appropriation of $15,000, made for the construction of a retaining wall and grading of the laboratory grounds has not been used, due to the fact that upon mature consideration it was not deemed advisable to begin the grading until the frame buildings above alluded to had been removed and replaced by a permanent brick structure. The result is, the laboratory grounds are ungraded and incapable of being properly cared for, and present an unfavorable contrast to the neatly kept adjoining grounds of the Naval Medical School. Moreover, the laboratory grounds and the unsightly frame buildings are in full view of Riverside Park, and excite unfavorable comment from many.

Increased difficulty was experienced during last winter in heating the present frame animal house, due to the many leaks in the building, as a result of decay in the wood, and partly in consequence the loss among the breeding animals was considerable, resulting in the necessary purchase of an unusual number.

A 60-foot flagpole was erected by the office of the Supervising Architect in front of the laboratory building, from which the national ensign is displayed from sunrise to sunset each day.

Property return.—The great value of the card-index system of keeping the laboratory property return, which method was authorized by the bureau, has been more than ever demonstrated. By the use of this method it was possible to complete and transmit the return this year five days after the end of the fiscal year.

Journal Club.—The laboratory Journal Club met during the autumn, winter, and spring at regular intervals for the purpose of reviewing articles in the current medical and scientific journals, and for the exchange of views among the research workers in the laboratory.

NEED OF HOSPITAL FACILITIES IN CONNECTION WITH THE LABORATORY.

The Hygienic Laboratory is acknowledged by all to be now one of the five or six greatest research laboratories in the world. The amount and class of work turned out of the laboratory is second to none; but all other great laboratories, such as the Pasteur Institute, the Rockefeller Institute, and the Memorial Institute, have either a hospital of their own or have intimate connections with some hospital.

The time has now come when in order to obtain the best results from laboratory work there should be available a hospital attached to the laboratory to which patients suffering from a particular disease which it is desired to study could be admitted, so that the cases could be studied throughout all the stages of the disease. This has been particularly emphasized in the past year in studies upon pellagra and measles. The need has also been felt in connection with studies upon the thyroid gland, and in studies upon measles the officers were handicapped to such an extent that it was almost impossible to pursue their investigations. A hospital attached to the laboratory would round out the organization to such an extent that it would be possible to obtain the fullest value from the work done at the laboratory.

Recommendations have been made in previous years and are here repeated for an appropriation of $175,000 for an addition to the Hygienic Laboratory, part of which may be used for the reception of patients suffering with diseases being made the subject of special investigation.

NECESSITY OF INCREASE OF APPROPRIATION FOR MAINTENANCE OF HYGIENIC LABORATORY.

The sum of $20,000 is needed to carry on the work required to be done in the Hygienic Laboratory during the fiscal year 1913, and a deficiency appropriation of $5,000 should be made to meet expenses during the fiscal year 1912.

The appropriation of $14,900, contained in the act making appropriation for sundry civil expenses of the Government for the fiscal year 1912, will be insufficient to adequately carry on the work required to be done, and in the estimate of expenses the item for the purpose mentioned was $20,000.

The Hygienic Laboratory was established for the investigation of contagious and infectious diseases and matters pertaining to the public health. It is the only institution of the kind maintained by the Government, and it has important duties to perform.

The investigations conducted thus far have had a great influence on public-health administration, and the necessity for enlargement is increasing.

A number of exceedingly important public health problems should be investigated. These are measles, scarlet fever, and amoebic dysentery, the disposal of sewage, especially in rural communities, the influence of irrespirable gases on health in manufactories, and the effects of artificial illuminants on vision. Some of these studies have been begun but without necessary funds they can not be carried to completion.

The most urgent need of additional funds, however, is in connection with the enforcement of the law of July 1, 1902, regulating the propagation and sale in interstate traffic of viruses, serums, and toxins. The enforcement of this law and the regulations issued thereunder requires that the products of licensed establishments shall be obtained from time to time in the open market and tested for purity and potency. Up to the past two years it has been the custom to buy these products in different sections of the country for examination, with the result that some were found from time to time contaminated or below potency, and consequently required to be withdrawn from the market. On account of increased expenditures absolutely necessary it has become impracticable to make such purchases, only about $20 having been expended for this purpose during the fiscal year 1910. The value of this law has been amply demonstrated; for its proper enforcement this fund should be increased, and it is earnestly recommended that the appropriation be increased in accordance with the estimate submitted.

Aid to other branches of the Government.—During the fiscal year 109 specimens of water were examined at the request of the health officer of the District of Columbia and reports made thereon. These specimens included samples of water chiefly from public wells in the District and several samples of bottled waters.

At the request of the Civil Service Commission the laboratory aided in rating papers of applicants for the position of professor of chemistry in the Hygienic Laboratory. In addition, members of the laboratory corps gave advice to the commission in the preparation of examination papers to be used for the purpose of obtaining eligibles for filling scientific positions in the Government.

At the request of the Director of the Bureau of Mines four specimens of blood from miners who had been killed in a mine explosion were examined to determine whether death was due to carbon monoxide poisoning. The examination showed all four specimens to contain carbon monoxide in demonstrable amounts. In addition, consultation was had with a representative of the Bureau of Mines as to the collection of future samples for examination.

During the year the assistance of members of the laboratory corps was requested by the Bureau of Chemistry of the Department of Agriculture in the prosecution of certain alleged violators of the pure food and drugs act. Technical Asst. Worth Hale assisted in the prosecution of the coca-cola case in Chattanooga, Tenn., and the director of the laboratory aided in the prosecution resulting from a seizure of a lot of frozen eggs, the trial being held at Trenton, N. J.

The director delivered several lectures during the year before members of the Naval Medical School.

Examination of Government employees for tuberculosis.—During the fiscal year 14 persons were examined at the request of their administrative superiors to determine whether they were suffering from tuberculosis. Seven of the 14 presented positive evidence.

It is probable that tuberculosis is fairly common among Government employees and that it is more frequent among those in certain offices than in others. This emphasizes the great importance of a thorough physical examination of all persons preliminary to entering the Government service. This is of importance not alone to the Government in securing the services of persons in good physical condition, but is of importance to the employees, so that they may not be compelled to perform duties having a deleterious effect upon their physical well being. Regular sanitary inspections of Government buildings and workshops would have a like effect and should be authorized by law.

Cooperation with the Pharmacopœia.—The cooperation of the laboratory with the revision committee of the Pharmacopœia has been continued. The executive committee adopted a resolution requesting the laboratory to prepare the sections to be incorporated in the next revision of the pharmacopœia on standard methods for the determination of boiling points, melting points, and solubilities. In addition, the laboratory, through the director, as chairman of subcommittee No. 3, having charge of biological products and diagnostic reagents, has practically the preparation of the sections on these important products that will appear in the next revision of the Pharmacopœia.

Hygienic Laboratory bulletins.—The results of special investigations in the laboratory, as well as certain important researches to be mentioned under the appropriate divisions, are contained in hygienic laboratory bulletins. Reference to these bulletins will be found under the heading "Publications."

DIVISION OF PATHOLOGY AND BACTERIOLOGY.

Standardization of tuberculin.—Work on the standardization of tuberculin, to which allusion has been made in previous reports, was continued, without, however, resulting in the formulation of a satisfactory method. This is a problem that presents many more difficulties than were at first anticipated, but it is hoped that a satisfactory result may finally be obtained. The director of the laboratory paid a visit to the research laboratory at Saranac Lake in order to consult with Dr. Trudeau and Dr. Baldwin in regard to the question, and as a result of his visit a number of valuable suggestions were received. It is to be regretted that it has not been found possible thus far to adopt a standard for the control of this widely used therapeutic product, especially as tuberculin will not be admitted to the next revision of the Pharmacopœia, due to the lack of a governmental standard for it.

Studies of cholera diagnosis.—The recrudescence of cholera in Europe, especially in Italy, during the past fiscal year so greatly portended its appearance in this country that it was deemed wise that all officers attached to the laboratory should have special instruction in its bacteriological diagnosis. They have therefore perfected themselves in the various steps involved, so that at the present time there are a number of men attached to the laboratory who are competent to render expert opinion in the diagnosis of this disease. In addition, several officers, under bureau orders, have reported at the laboratory for instruction in the diagnosis of the disease. Moreover, there has been obtained, and stored in the laboratory, a large amount of cholera agglutinating serum for diagnostic purposes.

Standardization of disinfectants.—For many years one of the important lines of work of the laboratory has been with disinfectants, especially liquid disinfectants. The great need of a standard method for the examination of these agents has long been recognized by public health workers throughout the world, and as a result several methods have been proposed for this standardization. The two that have received the most notice up to a year ago have been the Rideal-Walker method and the Lancet modification of this method. During the past year the work was taken actively in hand by Passed Asst. Surg. T. B. McClintic and the director and as a result a standard method, known as the Hygienic Laboratory phenol coefficient, was evolved. This method has been favorably received and is now perhaps more widely used in the United States for the examination of disinfectants than any other method. A modification of the method is now being considered by the addition of organic matter, but this is still under discussion.

Examination of commercial disinfectants.—After the adoption of the standard method known as the hygienic laboratory phenol coefficient for the standardization of disinfectants, it was decided to secure in open market as many commercial or proprietary disinfectants as possible, examine them by using the standard method, and publish the results in a laboratory bulletin. Passed Asst. Surg. McClintic has, during the year, examined over 50 of these preparations, but the work has been interrupted by a temporary change in his duties. It is hoped before the end of the present fiscal year, he will have examined all of these disinfectants and submitted the results for publication in a bulletin.

There is hardly any other means by which greater fraud is practiced upon the public than in the exploitation of so-called disinfectants. Many of these substances, for which extravagant claims are made on the labels, possess practically no germicidal properties and it is believed that the control of these products should be taken in hand by the Federal Government.

Cultivation of typhoid organisms on vegetables.—In addition to the other studies made of typhoid fever Passed Asst. Surg. R. H. Creel occupied a portion of his time in the laboratory, in a study of the longevity of the typhoid bacillus on growing vegetables. He has found that the organism may be recovered after 31 days from the time the vegetables have been soiled with material containing the typhoid bacilli.

Acute anterior poliomyelitis.—As stated in the last annual report, Passed Asst. Surg. W. H. Frost was sent from the laboratory to cooperate with the Iowa State Board of Health in the investigation of an epidemic of poliomyelitis in Mason City, Iowa. A separate report has been made by him on his studies there. In addition, the laboratory has done considerable experimental work upon the question of poliomyelitis, having succeeded, with material collected by Dr. Frost in Iowa, in demonstrating the existence of abortive cases of poliomyelitis. The existence of these cases had long been suspected from clinical observations, but it had never been experimentally proved that they really existed. It was found that the clinical diagnosis of abortive cases of poliomyelitis was confirmed in 66 per cent of the cases studied by the laboratory. The importance of these cases from an epidemiological standpoint is of course exceedingly great.

In addition, studies have been made in the laboratory upon other phases of poliomyelitis, especial efforts being made to determine the portals of infection. These studies are being continued.

Studies of embalming fluids.—The work upon embalming has been continued. Samples of 25 commercial embalming fluids were bought in open market and examined chemically to determine their formaldehyd content and the presence of arsenic and mercury, the use of which latter, on account of medico-legal complications, should be prohibited. Exhaustive studies upon the preservative and sterilizing qualities of these commercial fluids were made upon rabbits dead of anthrax. Over 300 of these animals were embalmed by the different processes commonly employed by undertakers, with a view of determining the best method of embalming and the reliability of the fluids supplied to the trade.

This work was summarized in a paper read at the annual meeting of the National Funeral Directors' Association, held September 28, 1910, at Detroit, Mich., by Passed Asst. Surg. Edward Francis.

Further experiments have been made, using cadavers, and the results obtained have formed the basis of regulations governing the technique of embalming and the composition of the fluid to be employed in the transportation of bodies dead of communicable diseases. This work also has an important bearing on the preservation of bodies in our tropical possessions.

In compliance with the request of the National Funeral Directors' Association, a paper was presented at their annual meeting September 21, this year, at Atlantic City, concerning the work which has been in progress during the past summer. On completion of the experiments the data will be published.

Examination of pathological specimens.—Quite a number of pathological specimens were submitted to the laboratory by officers of the various service stations for examination and report. This included a number of specimens of blood to be examined for the Wassermann reaction for syphilis, the laboratory now being prepared to make these examinations for service officers.

In addition, four specimens from suspected cholera patients from the New York quarantine were brought to the laboratory for examination, with the result that in each instance it was determined that the material came from an undoubted case of cholera.

The growth of animal tissues outside the body.—On the recommendation of the director of the laboratory, Mr. John Sundwall, expert in pathology, was given a temporary appointment at the laboratory. Mr. Sundwall's time has been occupied in a study of the growth of tissues outside the body, both in the fluids from the normal and the abnormal living body, and in special synthetic media. The studies so far made have been exceedingly interesting, and it is believed very valuable results will follow.

The following tissues have been grown: Thyroid, spleen, bone marrow, suprarenal, liver, hypophysis cerebri, heart muscle, and kidney. It has been found that bone marrow and spleen grow much more freely and luxuriously than do the other tissues.

Experiments are in progress with a view to determine the effect of thyreodectomized animal's plasma on normal thyroid culture and on cultures from other ductless glands. Similar experiments are being made with plasma from animals with other organs removed.

The possibilities appear almost limitless. Much information should be gained regarding the causation and manner of progress of many pathological processes which take place in the various organs of the body. The presence in some cultures of much amitosis suggests a close relation to tumor formation and it is probable that the causation of these abnormal growths may be studied from this standpoint.

DIVISION OF ZOOLOGY.

International Commission of Zoological Nomenclature.—Cooperation with the International Commission on Zoological Nomenclature has been continued through the Hygienic Laboratory, Prof. Stiles serving as secretary of the commission. This commission is composed of 15 professional zoologists elected from the world at large and serving as an international court of appeals for nomenclatorial questions upon which differences of opinion arise. The Smithsonian Institution has furnished the secretary with a special private secretary for this work. Thirty-seven opinions have thus far been rendered. They are published by the Smithsonian Institution and distributed free to the zoological profession.

Index catalogue of medical and veterinary zoology.—The Division of Zoology of the Hygienic Laboratory and the Division of Zoology of the Bureau of Animal Industry have continued to cooperate in the preparation of an index catalogue of medical and veterinary zoology. The author's catalogue has now been published in full. Of the subject catalogue, the first manuscript draft of the cestoda and nearly the entire manuscript draft of nematoda have now been typewritten.

Determination of zoological specimens.—The Division of Zoology has continued to make zoological determinations of animal parasites for physicians, boards of health, etc., and a large number of such determinations as aid in diagnosis have been made.

Publications.—A number of articles have been written for the Public Health Reports and for various medical and educational journals dealing with practical problems of sanitation and the technical side of hookworm disease and Cochin China diarrhea.

Hookworm campaign and investigation.—The chief attention of the Division of Zoology this year has been occupied with the technical side of hookworm disease in connection with the eradication campaign carried on by the State boards of health as described in another portion of this report.

DIVISION OF PHARMACOLOGY.

There have been no changes in the personnel of the Division of Pharmacology. During the summer of 1910 Prof. C. W. Edmunds, of the University of Michigan, and Mr. R. de M. Taveau received temporary appointments as special experts, the former to work upon the methods for the standardization of ergot, the latter to undertake certain synthetic work in connection with ergot and to continue his studies upon certain compounds related to choline.

Digest of comments on the United States Pharmacopœia and National Formulary.—The work of abstracting the literature on the United States Pharmacopœia and National Formulary was continued. One bulletin (No. 75) has appeared and the manuscript of another is ready for the press; the latter completes the review of the literature of the decade represented by the last revision of the Pharmacopœia. This work continues to receive the highest commendations from the leading pharmaceutical journals of the world.

The Chemist and Druggist (London, July 1, 1911, p. 49) says:

> The work is really of an international character and should be useful to revisers of other pharmacopœias. * * * It is a work of general utility, because it brings together with remarkable clearness the published comments and criticisms on materia medica, and forms a good index of the work of the year such as is not published elsewhere.

In addition to the above work a number of problems in connection with the revision of the Pharmocopœia as an aid to the work have been considered, such as work on the standardization of the thyroid, on melting-point determinations, the development of a standard color solution for the standardization of the official tincture of caramel, the preparation of critical reviews of certain features of new foreign pharmacopoeias, the preparation of critical comments upon certain needs of revision of the Pharmacopœia as an aid to the work of various subcommittees. This work has led to the preparation and presentation, at pharmaceutical meetings and subsequent publication in the American Journal of Pharmacy and elsewhere, of a number of minor communications.

Standardization of ergot.—An extensive investigation of the various methods which have been proposed for the chemical and physiological standardization of ergot was made. The importance of this drug, its great chemical complexity, and the great variability of commercial preparations make this subject one of unusual importance. In addition to a study of the methods employed, a large number of commercial preparations were assayed; these were found to vary widely in activity and to be accompanied, in a number of instances, by misleading statements on the part of manufacturers. Various official methods for preparing galenical preparations of ergot were compared, and also some synthetic work on certain of the active principles undertaken as well as methods for their isolation. The results of some of these investigations have been incorporated into a laboratory bulletin (No. 76).

Work similar to the above has been done on cotton-root bark, a drug alleged to have, in some respects, an ergot-like action.

Standardization of digitalis.—Work was continued on the physiological standardization of digitalis, and the results, especially as they relate to the variability of crude and medicinal preparations of this drug, were incorporated in Laboratory Bulletin No. 74. In addition to the investigations recorded in this bulletin, the action of the digestive enzymes on the digitalis series of heart tonics has been studied and the results incorporated in a paper presented, at the request of the officers of the section on pharmacology, at the annual meeting of the American Medical Association, June, 1911. Several proprietary preparations of digitalis were examined and the results incorporated in the above-mentioned bulletin.

In response to a request from the Philadelphia College of Pharmacy, Dr. Hale gave an address on the biological standardization of drugs, January, 1911, at Philadelphia.

The efficiency and toxicity of a number of remedies for hookworms.—The recognized importance of hookworm infection throughout the warmer parts of the United States made a thorough pharmacological study of the remedies which have been proposed for this condition seem desirable. About 20 such remedies have been investigated; a preliminary report on four of the more important of them was made at the meeting of the American Medical Association at Los Angeles, June, 1911. The work is being continued with the hope of finding less toxic or more efficient remedies. It has been found that some of the remedies advertised for use in this disease are worthless. In connection with this work the efficiency of a number of other vermifuges has been tested. Considerable chemical work on the solubility and methods of assaying thymol (the most generally used hookworm remedy) has been done.

Study of melting-point determinations, with special reference to the requirements of the United States Pharmacopœia.—The results of this investigation, originally undertaken at the request and with the coöperation of the board of trustees of the United States Pharmacopœial Convention, have been published in a laboratory bulletin (No. 70) of 106 pages. A standard method for determining the melting points of official preparations was proposed and the method applied to a number of important drugs.

It was hoped to make a similar study of boiling points, but other work has interfered.

The pharmacological action of choline and related compounds.—The results of an extensive series of studies on choline and related compounds were published as Laboratory Bulletin No. 73. The purpose of these studies was to endeavor to discover a compound more useful in conditions of vascular hypertension than the drugs at present available. While this object has not yet been realized, the investigations have thrown much light upon the physiological action of these compounds, which are of interest not only in relation to pharmacology, but in relation to toxicology and dietetics, as they occur or are easily formed in many important articles of food. The work is being continued.

Thyroid.—Research has been continued upon the thyroid. It has been shown that certain diets have specific effects upon the secretion of this gland. Many iodine determinations have been made in normal and pathological thyroids of both man and the lower animals, with the object of determining the relation, if any, between this element and abnormal conditions of the gland, and the effects of season and of diet upon the iodine content. As the result of this work, it has been suggested that the United States Pharmacopœia require a definite iodine content in the official preparation; the various methods of assay have been critically examined, and the one which seemed most accurate and convenient recommended for adoption as an official method. Some of this work was done with the cooperation of the committee of revision of the United States Pharmacopœia. The effects of a large number of iodine compounds upon the thyroid were investigated. This work resulted in the discovery of an iodine compound having a specific ("thyreotropic") action upon the gland. A preliminary report of this work appeared in the Journal of Pharmacology and Experimental Therapeutics.

Toxicity of serum and of certain proteins.—Physiological experiments with horse serum and with certain vegetable proteins have been continued. It was found that whereas certain animals die of respiratory failure, due to contraction of the smooth muscle of the bronchi (Journal of Pharmacology and Experimental Therapeutics, 1911, 2, p. 375), others die from a constriction of the arterioles of the lungs and an effect on the heart. The physiological processes involved in anaphylaxis and in the tolerance (so-called immunity) to serum were also analyzed and a preliminary report published. The purpose of these investigations, which are being continued, is to obtain further knowledge concerning the therapeutic use of antitoxic sera.

Studies of cannabis indica.—Cannabis indica has recently assumed importance in this country, partly because of its use by certain colonies of foreigners and partly because of an attempt to substitute it for morphine and some of the better-known narcotics. An attempt has been made to find a satisfactory method for standardizing the drug. This has been attended with a certain degree of success, so that it is now possible to determine the value of an extract within 25 to 30 per cent.

Miscellaneous examinations.—The examination of drugs for use in the marine hospitals and relief stations has been continued. The quality of the drugs, submitted on competitive bids, has continued to improve. Of 107 samples examined, only 4 were found unsatisfactory, which is a lower percentage than in any previous year.

This work has frequently led to the finding of improved methods of analysis.

Some work was also done on the occurrence of copper in oysters. The work agreed with that done elsewhere in showing that this metal is probably constantly found in these animals.

Cooperation with other divisions of the laboratory, with other departments, with the American Medical Association, etc.—The Division of Pharmacology has cooperated with other divisions of the laboratory on a number of subjects. Thus it cooperated with the Division of Pathology and Bacteriology in an examination of certain methods for the preparation of culture media, in the examination of certain so-called antitoxic sera, and in the study of certain phases of anaphylaxis.

It cooperated with the Division of Zoology in certain work on hookworm remedies.

The division was also called upon to cooperate with the Department of Agriculture in connection with certain cases under the pure food and drugs act. Thus the Secretary of Agriculture, through the Secretary of the Treasury, requested that certain experimental work with caffeine be undertaken, and Dr. Hale spent three weeks in attendance upon a trial in which the use of this substance in a beverage was a point at issue. Similar cooperation was asked in connection with certain cases involving the use of the term "lithia water"; these cases, however, did not come to trial.

Some work on the assay of medicated soft drinks was done in cooperation with the Association of Official Agricultural Chemists.

Cooperation with the American Medical Association in connection with the Council on Pharmacy and Chemistry has been continued; two members of the division are, with the approval of the Secretary of the Treasury, members of this council. Members of the division have also served on various other committees of this association and as officers of the section of pharmacology. Similar cooperation has been maintained with the American Pharmaceutical Association.

Two members of the division are members of the committee of revision of the United States Pharmacopœia, and have taken part in the work of various subcommittees of this committee.

The professor of pharmacology was detailed to represent the service at the International Congress of Pharmacy held in Brussels, Belgium, September, 1910; the International Conference for the Study of Cancer held in Paris, October, 1910; and the International Conference on Tuberculosis held in Brussels, October, 1910; reports on these meetings appeared in Public Health Reports. Members of the division attended various other medical and scientific meetings during the year.

DIVISION OF CHEMISTRY.

Until Prof. E. C. Franklin arrived June 17, there had been no changes in the personnel. The following is a summary of the research and routine work carried on in the division during the year:

First. Expert opinions, reports, and advice have been rendered on the following subjects:

(1) An apparatus for the determination of carbon dioxide in the air; for the Supervising Architect's Office, Treasury Department.

(2) The necessary apparatus for the sanitary analysis of milk and water; for the secretary Territorial board of health of Arizona.

(3) On the determination of ammonia in the sanitary water analysis; for the Pharmacist A. H. Thomas, San Francisco, Cal.

Second. The analytic work of the division has included the following:

(1) Water, 7 samples (1 technical examination).

(2) Human milk, 2 samples.

(3) Embalming fluids; tests for chloral, 32, for formaldehyde (quantitative), 32; for arsenic, 32; also tested for various heavy metals, glycerol, and other possible constituents.

(4) Oysters, for amount of copper, 57 samples.

(5) Drugs, tested in accordance with the requirements of the United States Pharmacopœia, 37 samples.

(6) Blood, for carbon monoxide, 4 samples.

(7) Urine, for formaldehyde, 1 sample.
(8) Culture bouillon, for organic and mineral matter, 8 samples.
(9) Urinary calculus, 1 sample.
(10) Hyco disinfectant, 1 sample.

A very considerable number of determinations of formaldehyde in commercial and laboratory embalming fluids and solutions of the gas were made, and a number of various determinations—chlorine in hypochlorite solutions, potassium chloride, etc.—were also made.

Third. Research has been conducted along the following lines:

(1) The assay of the halogen-containing compounds of the United States Pharmacopœia.
(2) Improved methods for the assay of other United States Pharmacopœia substances.
(3) Septic tank privies for rural use.
(4) A new form of sulphur burner for disinfection and modifications thereof for special purposes.
(5) The preparation and stability of embalming fluids.
(6) Improvements in the technic of the Wassermann reaction for syphilis.
(7) The determination of alkaloids.
(8) A respiration apparatus for use in ships disinfected with sulphur dioxide.

Fourth. The attention of the division has been given to the following miscellaneous subjects:

(1) Multiple effect and other devices for increasing the efficiency of distillation apparatus.
(2) The preparation of a service exhibit for the meeting of the American Public Health Association in Milwaukee in September, 1910.
(3) A study of methods of sewage disposal and purification.
(4) The investigation of a disagreeable odor at the United States Capitol.
(5) The preparation of a large number of standard and other solutions for the other divisions of the laboratory and the analysis of several solutions of this nature, also a number of weighings were made for various other workers in the laboratory.

Of the above activities of the division, the following items deserve further mention:

Advice concerning an apparatus for determination of carbon dioxide in air.—At the request of the Supervising Architect's Office of the Treasury Department the division assisted one of their engineers in devising and testing an apparatus for the quick and reasonably accurate estimation of CO_2 in the air of occupied rooms. The final tests can not be made until cold weather, but with this exception the work is completed and satisfactory.

Water analysis.—In addition to the usual sanitary water analyses, an examination was made of the water used for making steam at Fort Stanton, N. Mex. It was found to contain a great excess of scale-forming ingredients, especially gypsum.

Embalming fluids.—The division cooperated with the assistant director in the investigation of embalming fluids. The work of the division in this investigation included (1) the analysis of 32 commercial fluids and (2) the preparation of a considerable number of experimental fluids for use by the assistant director. The principal objectionable ingredient sought in the commercial fluids was arsenic; this was found in large amounts in two of the samples, one of which was labeled "Nonarsenical"; also, in traces, in several others, most probably having been introduced as a result of the use of cheap commercial glycerin. The importance of these traces of arsenic lies in the possibility of medicolegal complications.

Determination of copper in oysters.—Studies were made to determine the possible relation between the copper content of oysters and unhygienic conditions in the oyster beds, the possibility of the intentional addition of copper being also considered. Small but widely varying amounts of copper were found in all the samples examined.

Examination of blood for carbon monoxide.—This was done at the request of the Bureau of Mines, the specimens being taken from the bodies of three men and a mule after a colliery explosion in West Virginia. Carbon monoxide was found in abundance in all four specimens, and the opinion was rendered that it might have been either the direct or a contributing cause of death, or (not contributing materially to death) the gas might have been absorbed after the receipt of the fatal injury before or even after life was extinct.

Sewage disposal and sanitary privies for rural districts.—There is a great need for a safe, cheap, and easily operated method for the disposal of human excreta in the country districts and other places in which a water-carriage system is not available, such places being even more apt than crowded cities to be infested with typhoid, hookworm, and other intestinal infections.

The most promising principle is the destruction of the pathogens by prolonged action of the saprophytes, mostly anerobic (supplemented, if necessary, by heat, chemicals, etc.). This division has for the past year been cooperating with Prof. Stiles and Passed Asst. Surg. Lumsden in the design and construction on this principle of a number of types of sanitary privy vault. Experiments are also in progress with respect to supplementary biologic processes for still further safeguarding and disposing of the effluent from the original process.

Sulphur burners for disinfection and the extermination of noxious animals.—The methods now in use for the destruction of disease-bearing animals, both on land and on shipboard, are relatively inefficient and untrustworthy, and very expensive on the large scale. In an attempt to improve these methods, two forms of sulphur burner were devised, one for the interior of compartments, and the other for burrowing land animals (gophers, squirrels, etc.).

In this connection, experiments were made on the prevention of fire from sulphur-burning disinfecting apparatus. Sulphur-charged air being irrespirable, the practice has heretofore been to leave the burners unwatched, even during the particularly dangerous stage of burning off the alcohol, reliance being placed on various inconvenient and inefficient safety devices. Since the oxygen helmet has been perfected, it would seem that there is no good reason for not watching the fires, at least until the concentration of sulphur is sufficient to extinguish ordinary flames. Experiments were also made with a simple absorption apparatus to render the sulphur-charged air respirable, and even with the crudest apparatus it was possible to remain in a room with burning sulphur until after a gasoline torch went out. It is believed that further experimentation will develop an absorption apparatus efficient enough to render respiration possible in any concentration of SO_2 that can be produced with burners, inasmuch as the most efficient burners known do not use up over 8 of the 20 per cent of oxygen in the air, and the remaining 12 is enough to sustain respiration. However, it will never be necessary to remain in such an atmosphere, as the danger of fire is over long before the sulphur flame dies out.

Experiments on continuous regenerative distillation with difference of pressure.—Successful small-scale experiments were made on what appears to be a new method of distillation; namely, the continuous reuse of the heat set free by the condensation of a given weight of vapor to convert into vapor *an equal weight* of the liquid, the same heat being utilized for the purpose an *unlimited* number of times. This is accomplished by a form of countercurrent regenerative apparatus, the vapor passing through a pump or blower whereby the pressure on the condensation side is kept higher than that on the evaporation side, condensation thereby taking place at a higher temperature than evaporation. The essential difference between this and the ordinary methods of distillation consists in the use of *mechanically produced difference of pressure* to cause the heat to describe a complete continuous closed circuit within the apparatus, with consequent great economy in the process; whereas in the ordinary single or multiple effect apparatus heat in large quantities passes through the apparatus continuously in one direction, being degraded in its passage and thrown away at the end.

Experiments on the large scale and accurately quantitative will be made as soon as facilities and time are available.

New analytic methods.—In the course of the routine analytic work of the division a number of items of appropriate research suggested themselves and were carried out, the results being published or in manuscript ready for publication.

NINTH ANNUAL CONFERENCE OF STATE AND TERRITORIAL HEALTH AUTHORITIES.

In accordance with the act of Congress approved July 1, 1902, the ninth annual conference of State and Territorial health authorities with the Public Health and Marine-Hospital Service was held at the St. Francis Hotel, San Francisco, Cal., June 24, 1911. Twelve States and one Territory were represented by delegates.

The conference was called to order by the chairman, Asst. Surg. Gen. J. W. Kerr, representing the Surgeon General, who could not be present on account of official matters of great urgency requiring his attention in Washington.

In his opening remarks the chairman reviewed the matters of special importance that had engaged the attention of the bureau since the last conference, among them being measures for the protection of Alaska against smallpox, the lines of defense established to guard against the introduction of cholera from European and oriental ports, the progress made in investigations of leprosy, poliomyelitis, measles, and typhoid fever, and he referred especially to the sanitary survey being made of the Great Lakes in relation to the prevalence of typhoid fever in that section of the country. The work of the conference was then taken up as outlined in the provisional program.

INTERSTATE TRANSPORTATION OF THE DEAD.

The committee on interstate transportation of the dead, which was appointed during the eighth annual conference, presented its report through Dr. H. M. Bracken, chairman of the committee, and the conference subsequently adopted the following resolutions:

Resolved, That quarantine officials be given the same recognition as State officials of health in passing upon the transportation permits for dead bodies

sent into the United States from other countries, and that the restrictions as to the shipment of dead bodies from other countries be also applied to Alaska and other United States possessions.

Resolved, **That the suggestions relative to the method of undertaking bodies and the amount and standard of the embalming fluid used be made the basis of further study and investigation.**

COLLECTION OF MORBIDITY REPORTS.

The committee on the reporting of morbidity submitted its report through Dr. M. W. Richardson. This report embodies suggestions for an improved plan of collecting morbidity reports, which should include the following: (1) A list of diseases which present knowledge indicates should be reported in the interest of the community; (2) the minimum information to be given for each case reported; (3) the time and frequency for the reporting of cases; (4) the diseases which State authorities should report to the Federal authority.

On account of the extent and importance of the subject it was decided that the committee should be continued until the next conference and the work carried on in the meantime through correspondence.

MEASURES SUGGESTED FOR THE CONTROL OF POLIOMYELITIS.

On account of the widespread prevalance of poliomyelitis during the preceding year and its probable recurrence during the current year, the attention of the conference was invited to the importance of uniform methods of investigation of cases, and a blank form was submitted by the bureau with this end in view. With three slight amendments, this blank form was adopted. Copies of the same have been furnished by the bureau to the several State authorities.

RAILWAY SANITATION.

The desirability of calling a special conference to discuss railway sanitation was considered, and it was the consensus of opinion that steps should be taken under the law of July 1, 1902, to call such a conference at an early date, the railroads being invited to send representatives.

INSPECTION OF SERVICE OPERATIONS IN SAN FRANCISCO.

The afternoon session was devoted to an inspection of the Angel Island quarantine station, the immigration hospital, and the Federal plague laboratory.

CONSIDERATION OF ANTIPLAGUE MEASURES ON THE PACIFIC COAST.

During the evening session Surg. Rupert Blue presented a résumé of antiplague operations in California from September, 1907, to June, 1911, and Acting Asst. Surg. G. M. Converse described the measures for systematic rat destruction in San Francisco. There followed a discussion of the plague situation since its beginning by several members of the conference, after which the following resolution was adopted:

> *Resolved*, That this conference express its commendation of what has been done and is being done for the protection of the United States by the Federal, State, city, and county officials, and express full confidence in the measures now being taken here to protect against plague.

The conference was then declared adjourned.

INTERNATIONAL HYGIENE EXHIBITION OF DRESDEN.

In November, 1909, there was received a preliminary announcement of the International Hygiene Exhibition, to be held in Dresden from May to October, 1911, under the patronage of the King of Saxony and with the financial support of that State. Subsequently there were also received from section officers of the exhibition invitations to membership in two of the sections.

On April 13, 1910, a communication was received from the Department of State, forwarding a copy of a note from the German ambassador, extending, by direction of his Government, an invitation from the exhibition management to the Government of the United States to be represented at the exhibition. The ambassador stated that, in the opinion of the exhibition management, it would be a great advantage for the United States Government, like other foreign nations, to have a pavilion of its own for its exhibits and those of the American municipalities. The hope was also expressed in his communication that an American commissioner would be named who, in turn, would organize an American committee that would urge the scientific institutions of the country to be suitably represented.

In his communication the honorable the Secretary of State stated that Congress had made no provision for participation in the above-mentioned exhibition, but that possibly some exhibits might be sent, the expenses to be borne by the Treasury Department.

Since Congress had made no provision for participation in the exhibition, it was necessary to inform the Secretary of State that while the advantages of participating in the exhibition were obvious, in the absence of an appropriation for the purpose it would be impossible for the Treasury Department to prepare and send an exhibit to Dresden.

In view of the date of the receipt of the above-mentioned correspondence and the fact that the regular estimates had previously been submitted to Congress, it was apparently impracticable for the State Department to secure an appropriation before adjournment of that body.

In the meantime communications received from abroad continued to emphasize the importance of the exhibition and the participation of the Federal Government therein. The matter was therefore made the subject of conference with officers of the Department of State, and the impression was gained that while there would be great difficulty in securing an appropriation from Congress for the purpose yet if the recommendations were sufficiently strong an attempt would be made to obtain such an appropriation at the succeeding session of the Congress. Steps were therefore taken on which to base these recommendations, and Surg. J. M. Eager, whose detail in

Naples on account of the cholera situation had terminated, was instructed to return to the United States by way of Dresden in order to collect complete data regarding local conditions and the steps that would be necessary for participation by the Federal Government in the exhibition.

In the meantime the question of the formation of a national committee had been brought to the attention of the officers of the American Public Health Association by the exposition management, and a conference was called to meet September 9, 1910, in connection with the annual meeting of that association to consider the formation of a national committee. As a result of its deliberations this conference adopted the following resolutions:

Resolved, That it is the sense of the American Public Health Association that the participation of the United States in the Internaional Hygiene Exhibition, Dresden, 1911, can best be conducted by the committee on organization of the International Congress on Hygiene and Demography.

Resolved, That a committee should be appointed by the American Public Health Association to cooperate with the committee on organization and to enlist the cooperation of the members of this association.

Resolved, That it is imperatively necessary that early action should be taken by Congress in regard to obtaining the necessary appropriations and that all the Federal departments, States, and municipalities likely to participate be at once notified of the official invitation and scope of the proposed exhibit.

Dr. Eager having arrived in the bureau and reported, a copy of his report was forwarded on December 12, 1910, to the Department of State, together with an estimate of the minimum amount that would be required in case of participation by the Government.

The object of the exhibition was also fully set forth in the statement prepared by the Surgeon General, and the desirability of participating in this great health enterprise was strongly dwelt upon. The reasons why the invitation of the German Government to attend the exhibition should be accepted were summarized, as follows: (1) The exhibition was designed to promote the health of all mankind, and therefore deserved the support of every nation. (2) The German Government responded to the invitation of the Federal Government to send exhibits to the Louisiana Purchase Exposition at St. Louis, Mo., and to the International Tuberculosis Congress held in Washington. (3) An exhibition is contemplated in connection with the Fifteenth International Congress on Hygiene and Demography to be held in Washington in 1912, and as Germany has made great progress in public health matters it is very desirable to secure the participation of that government both in the congress and the exhibition connected with it. (4) An exhibit of the progress of hygiene in this country from a governmental standpoint would demonstrate certain lines of activity peculiar to this country and afford opportunity for comparison with public health work done abroad. (5) Participation by the Government in the exhibition would encourage scientific societies and industrial organizations to send exhibits, which would prove a potent factor in stimulating commerce in hygienic and safety devices made in America.

These representations were duly transmitted to Congress by the Secretary of State, but failed to receive consideration at the hands of that body.

The inability of the Federal Government to participate in an international enterprise of the character mentioned and the lack of provision for the preparation of suitable sanitary exhibits for the education of the public emphasizes the great desirability of the establishment and maintenance of a museum of hygiene, which institution should be located at the seat of government and from which could be secured from time to time necessary materials for purposes of exhibition, not only in this country, but in foreign countries.

FIFTH INTERNATIONAL SANITARY CONFERENCE OF THE AMERICAN REPUBLICS.

At the Fourth International Sanitary Conference of the American Republics, which was held in San Jose, Costa Rica, from December 25, 1909, to January 3, 1910, a resolution was adopted to the effect that the next meeting would be held at Santiago, Chile, subject to the call of the International Sanitary Bureau.

In accordance with this resolution, and after obtaining the acquiescence of the Government of Chile and the approval of the members of the International Sanitary Bureau, a call was issued May 12, 1911, for the Fifth International Sanitary Conference to meet at Santiago, Chile, November 1–12, 1911.

Pursuant to the provisions of paragraph 7 of the resolutions relative to sanitary police, adopted at the Second International Conference of American States, a copy of the call was forwarded under date of May 10, 1911, to the Director General of the Pan-American Union, with the request that the necessary measures be taken to bring the call and the provisional program for the conference to the notice of the Governments concerned.

The text of the call and program prepared by the chairman of the International Sanitary Bureau follows:

FIFTH INTERNATIONAL SANITARY CONFERENCE OF THE AMERICAN REPUBLICS.

[To be held in the city of Santiago, Chile, Nov. 5–12, 1911.]

INTERNATIONAL SANITARY BUREAU OF THE AMERICAN REPUBLIC,
Washington, D. C., May 12, 1911.

Announcement is hereby made that, is compliance with a resolution adopted at the Fourth International Sanitary Conference, the Fifth International Sanitary Conference of the American Republics will be held in Santiago, Chile, November 1–12, 1911, under the presidency of Dr. Alexander Del Rio and the auspices of the Chilean Government.

The attendance of representatives of every American Republic is earnestly desired, including those which have not taken part in previous conferences.

As stated in the provisional program, a number of subjects will be discussed at Santiago, which are of vital interest to all the nations of this continent, and it is expected that the deliberations of this conference will be fully as important and fruitful in results as the preceding ones. The provisional program which follows is subject to amendment or revision, as may subsequently seem advisable.

PROVISIONAL PROGRAM.

1. Reports by the several delegations in regard to the sanitary legislation enacted in their respective countries since the last conference.
2. Special reports relative to the means employed in the different countries for the enforcement of the resolutions agreed to in the last convention.
3. Reports discussing the vital and morbidity statistics of each country during the last two years.
4. Special reports on the sanitary progress of the principal cities in each country.

5. Discussion of measures relative to social hygiene, with special reference to venereal diseases.

6. Determination of what constitutes immunity to yellow fever.

7. Discussion of hygiene of sea traffic, having in view specially systematic measures for the deratization of ships.

8. Discussion of hygiene of tramway and railroad traffic.

By direction of the International Sanitary Bureau of the American Republics.

WALTER WYMAN, *Chairman.*

Subsequently the Chilean Government issued a provisional program which conformed substantially to the program issued by the International Sanitary Bureau. In order to secure uniformity this latter program was followed by the bureau in preparing reports for the use of the United States delegates.

Owing to demands made upon the Surgeon General's time it was impossible for him to be present at the conference, and Surgs. G. M. Guiteras and J. C. Perry, of the service, who possess a knowledge of the Spanish language, were officially detailed as representatives of the United States Government at the conference.

In the instructions furnished the delegates special attention was invited to the measures adopted at previous conventions, and the necessity of governing their acts in such a way as would result in forwarding the cause of international sanitation and maintaining the cordial relations existing among the nations of the Western Hemisphere.

REPRESENTATION AT MEETINGS OF SCIENTIFIC AND SANITARY ASSOCIATIONS AND CONGRESSES.

During the year officers were detailed to the following meetings of scientific and sanitary associations and congresses in the United States and abroad:

American Institute of Homeopathy, Pasadena, Cal., July 11–15, 1910.

British Medical Association, London, England, July 27–29, 1910.

International Zoological Congress, Gratz, Austria, August 15–20, 1910.

Tenth International Congress of Pharmacy, Brussels, Belgium, September 1–6, 1910.

American Public Health Association, Milwaukee, Wis., September 5–9, 1910.

Mississippi Valley Medical Association, Detroit, Mich., September 13–15, 1910.

Iowa State Association of Municipal Health Officers, Waterloo, Iowa, September 20–22, 1910.

Second International Conference for the Study of Cancer, Paris, France, October 1–5, 1910.

Medical Society of the State of Pennsylvania, Pittsburgh, Pa., October 4–6, 1910.

Ninth International Antituberculosis Conference, Brussels, Belgium, October 5–8, 1910.

Association of Military Surgeons, Richmond, Va., November 1–4, 1910.

Southern Medical Association, Nashville, Tenn., November 8–10, 1910.

American Association for the Study and Prevention of Infant Mortality, Baltimore, Md., November 9–10, 1910.

Ohio Valley Medical Association, Evansville, Ind., November 9–10, 1910.

Conference of Sanitary Officers of the State of New York, Buffalo, N. Y., November 16–18, 1910.

Western Pennsylvania Public Health Conference, Pittsburgh, Pa., November 29–December 1, 1910.

New York Conference on Milk Problems, New York City, December 2–3, 1910.

Washington State Health Officers Conference, Seattle, Wash., December 14–15, 1910.

Conference on Hookworm Disease, Atlanta, Ga., February 14–15, 1911.

Council on Pharmacy and Chemistry, American Medical Association, Chicago, Ill., February 17, 1911.

Association of American Medical Colleges, Chicago, Ill., February 27–28, 1911.

National Conference of State Medical Examining and Licensing Boards, Chicago, Ill., February 28, 1911.

Conference on Medical Education and Legislation (American Medical Association), Chicago, Ill., March 1–3, 1911.

Southern Commercial Congress, Atlanta, Ga., March 8–11, 1911.

New York Academy of Medicine, New York City, March 16, 1911.

American Association of Pathologists and Bacteriologists, Chicago, Ill., April 14–15, 1911.

Ohio State Medical Association, Cleveland, Ohio, May 8–11, 1911.

National Dental Association, Cleveland, Ohio, May 10, 1911.

American Society of Tropical Medicine, New Orleans, La., May 18–19, 1911.

Virginia Conference on Conservation of Child Life, Richmond, Va., May 22, 1911.

American Association of Medical Milk Commissions, Philadelphia, Pa., May 23–24, 1911.

National Housing Association, New York City, June 3–6, 1911.

Conference of State and Territorial Health Officers, San Francisco, Cal., June 24–25, 1911.

Conference of State and Provincial Health Officers, Los Angeles, Cal., June 30–July 1, 1911.

National Conference of Charities and Corrections, Boston, Mass., June 7–14, 1911.

Association of Surgeons of the Norfolk and Western Railway, Richmond, Va., June 15–16, 1911.

National Association for the Study and Prevention of Tuberculosis, Denver, Colo., June 20–21, 1911.

National Medical Association, Los Angeles, Cal., June 26–30, 1911.

MARITIME QUARANTINE.

TOTAL INSPECTIONS.

In administering maritime quarantine during the fiscal year the service has inspected a total of 15,160 vessels at the domestic and insular quarantine stations and at foreign ports. Of this number, 1,801 were fumigated or disinfected either on account of actual infection or for the destruction of disease carriers, such as rats and mosquitoes. Passengers and crews to the number of 1,516,445 were also inspected to determine whether they were infected with any of the diseases quarantinable under the Treasury regulations.

QUARANTINE AGAINST CHOLERA FROM RUSSIA AND ITALY.

The most acute situation facing the service during the past summer and fall was caused by the widespread epidemics of cholera in Russia and Italy. Immigrants from infected localities in both these countries were continuously arriving in large numbers, and it was a grave question whether the quarantine measures, however carefully enforced, could be effective in preventing a lodgment of the disease in the United States. True, the service had been successful in the previous year, but the experiences of that year had demonstrated how many avenues were to be guarded, and how any relaxation of vigilance at any point in the line of defense might prove disastrous. To the comforting assertion that should cholera gain admission, American energy and intelligence, the increased effectiveness of our State and municipal boards of health, and the activities of the service would prevent a general epidemic, was opposed the knowledge of the impure-water supplies of so many of our towns and cities, and so many rural districts with no sewerage system. These are principal causes of the widespread prevalence of typhoid fever, and since cholera spreads in much the same manner as typhoid and is practically a water-borne disease, it is impossible to view without the greatest apprehension the possible effects of the introduction of cholera infection.

The subject of cholera carriers also had become more thoroughly understood and appreciated, and it is believed the danger therefrom is increased with the increase in time of prevalence of the disease in infected localities, and this was the second year of violent epidemics in Russia and Italy. Cholera-bacillus carriers are individuals who carry the vibrio of cholera in their intestinal tracts, or probably at times in the gall bladder, and yet exhibit no clinical symptoms of the disease. Persons who have had the disease and recovered may continue to be carriers for days or weeks, others may be carriers for a short period before developing clinical symptoms, and still others, who have been in direct or indirect contact with the sick or with other carriers, may become carriers for varying periods without being ill at any time. In places where cholera is epidemic there will usually be found a number of healthy carriers.

An addition was therefore made to the quarantine regulations requiring that all steerage passengers arriving at United States ports from ports or places infected with cholera shall be subjected to a bacteriological examination, and shall not be admitted to entry until it has been determined by said examination that they are not cholera-bacillus carriers. This regulation was put immediately into force, and experienced officers were detailed to those ports where the maritime quarantine is not in charge of officers of the Public Health and Marine-Hospital Service, but which are, nevertheless, subject to the Treasury Department regulations, and at which immigrants arrive from infected territory.

The bacteriological examination of every steerage passenger from an infected port or place at first seemed too great an undertaking to be practicable, but it has been successfully done.

The value of this measure is seen in the results at the New York quarantine, where 26 cholera carriers were discovered.

The steamship companies, yielding to representations by refusing to sell tickets to persons in the infected regions, materially decreased the immigration from Italy and the consequent danger connected therewith.

The statistics regarding cholera during the past year will be found in a succeeding chapter (p. 189), but for an appreciation of the situation it may be said here that in Russia between May 6, 1910, and February 4, 1911, there were reported 216,796 cases, with 100,982 deaths. After February 4, 1911, no reports were received, and the disease apparently subsided until April 21, from which date to October 7, 1911, there have been reported 2,003 cases, with 1,018 deaths.

In Italy, as stated in the last annual report, the disease was first announced in 1910 on August 17, and was reported until January 30, 1911. Within that period there were officially reported 1,436 cases, with 660 deaths. After January 30, 1911, no official reports were received until June 8. From that date to October 7, 1911, 14,821 cases, with 5,486 deaths, have been officially reported. It will be observed that the epidemic began more than two months earlier this year than last, and was both more severe and more widely extended throughout Italy, reaching also Marseille, in France.

On January 9, 1911, Surg. Geddings reported the reappearance of cholera in southern Italy. He stated that it was his opinion that the disease was on the increase and that the city of Naples was probably in more danger from the Province of Bari than it was during the August previous. The sanitary conditions were reported unfavorable, and it was noted that the term "gastro-enteritis" had again made its appearance in the local sanitary reports. It was also stated that if conditions did not improve, it was believed that prospective travelers should be informed as to the danger of traveling in Italy during the spring and summer, as conditions might possibly become worse rather than better. This information was published in the weekly Public Health Reports January 27, 1911.

Details of the usual and extraordinary measures enforced to repel an invasion of the disease are given under the following heads:

(1) Foreign measures against the Russian epidemic.
  Control stations on the Russo-German frontier.
  Russian emigration via Libau and English ports.
  Russian emigration via other European ports.
(2) Foreign measures against the Italian epidemic.
(3) Measures enforced at sea.
  Assistance of the Italian royal commissioners.
(4) Special quarantine measures at ports of the United States.
(5) Supplemental inspection at the immigration stations after passing quarantine.
(6) Immigration destination cards sent to State health officers.
(7) Dissemination of information concerning cholera to State and local health authorities.
(8) Location of experts at convenient places for speedy determination of suspected cases.

FOREIGN MEASURES AGAINST THE RUSSIAN EPIDEMIC.

The great bulk of Russian emigrants to the United States passes over the Russo-German frontier to the several German seaports for embarkation. At the German frontier the emigrants are halted and examined at some ten control stations. This measure, primarily for the protection of Germany, is equally protective to the United States.

In previous years these control stations have been inspected by our own service officers, and the reports have always been commendatory and such as to give confidence. In view of its importance to the United States, a description of these frontier defenses is here given, as abstracted from a report June 8, 1911, from Hon. R. P. Skinner, United States consul general at Hamburg.

GERMAN FRONTIER CHOLERA CONTROL STATIONS.

The causes which primarily led to the establishment of the 10 cholera control stations located on the Russian and Austrian frontier, were due to the disastrous epidemic of cholera which occurred in Hamburg in 1892, which demonstrated both to the Hamburg and Prussian Governments the necessity of controlling in some way the growing volume of immigration which annually traverses Prussia from east to west. The measures which were taken in the inspection of the immigrants have steadily improved from year to year, until now they include the scrutiny of all passengers bound for America and other oversea countries, both at the 10 frontier control stations located on the Russian and Austrian frontiers and also at the ports of embarkation.

The first of the control stations is located at the extreme northeast confines of Prussia at Bajohren, and the last station is located at Myslowitz, at the southeast extremity of the country, where the frontiers of Prussia, Russia, and Austria meet. The system of controlling practiced is said to be an interesting combination of hygienic and commercial enterprise. In the carrying out of the program as a whole, the Prussian Government has established certain regulations, the execution of which has been intrusted to the Hamburg-American Line and the North German Lloyd Line, both acting as one under the Government concession. From time to time the control stations are inspected by the Prussian health authorities, who issue instructions in regard to the work in hand. It is impossible for any immigrants to enter Prussia lawfully without passing through one of the 10 control stations, all of which are under the direct management of the two German companies interested in American immigration. Any other steamship company desiring to sell passage to the United States must not only secure a Government license, but must submit to having its passengers enter the country via a control station. When individuals entering the United States are refused on account of their physical condition (and it is said that about 3 per cent are rejected on this account), they are then directed to South America as a last resource.

From Bajohren to Myslowitz, the extreme points of the Russia-Prussian frontier, as mentioned above—which by the way is not marked by any rivers of considerable size or other natural boundaries—there is a Russian military guard on duty at all times. At the control stations begins the execution of American laws governing quarantine matters and immigration generally. The chief concern of those in charge is to point out persons who would be rejected should they arrive in the United States, and prevent them from becoming the cause of loss to ocean carriers. The weeding out of passengers who might be weeded out at New York is undertaken with the greatest exactness; but this aside, all other measures of sanitary control are reduced to a strict minimum because of the insuperable objection of the emigrant to bathing, disinfection of his effects, or other modes of interference with his customary habits. During the prevalence of cholera in Russia the bathing of emigrants at control stations and the disinfection of their clothing was rigorously insisted upon.

For commercial reasons the supervision of emigrants arriving at the control stations is made as lenient as due regard for the subsequent effect of American law renders advisable. Under the rules formulated by the Prussian Government for the guidance of the steamship companies' officers on the frontier, the inspecting physicians are given a large amount of discretion, which they exercise freely. The examination of new arrivals in an unclothed condition is undertaken only when the physician deems it indispensable, and baths are obligatory only when individuals are so filthy that their bodily inspection is rendered impossible otherwise. In other words, when there is fear lest cholera extend to Germany from Russia the examination at the control stations is rigorous. With the subsidence of this fear the inspection at the control stations is reduced to practically a visual examination of the emigrant by the physician, the excellent shower baths at every station remaining unused, and there being no disinfection of effects whatever. However, during the prevalence of cholera in Russia bathing of emigrants was obligatory and was performed in a very thorough manner, and their effects were disinfected with live steam, the disinfection continuing for 30 minutes or more and including every class of effects except leather goods and furs, which are treated otherwise. The excreta of the emigrants is sterilized; and while there is a very great difference between stations in the matter of sewage disposal, there is in each of them a fair supervision of the sanitary arrangements, and in some instances there is not only supervision but a condition of absolute cleanliness. It may be stated that while there is everywhere a very sincere respect for the emigrants' personal susceptibilities and intuitive objections to baths and cleanly habits, there is on the whole a system of segregation and observation so carried out that almost any case of contagious disease would be discovered at once, traced to its origin, and followed by such sweeping sanitary precautions as would tend to prevent the spread of the disease in Prussia. It is very seldom that emigrants actually depart for the United States without having been under sanitary observation at least two days, frequently longer. A large portion of the passengers reaching the control stations are obliged to wait there a day or more before their effects arrive by rail from Russia. Once a day at least emigrants are forwarded in special cars attached to regular trains from the 10 stations on the frontier itself to the eleventh station, which is located at Ruhleben, in the neighborhood of Berlin. At the Ruhleben station all passengers disembark and, after a summary examination, are forwarded in special trains to Hamburg, Bremen, or are sent on to Rotterdam or any other port of departure for which they are booked. Upon arrival at Hamburg—and the arrangements are substantially the same at Bremen—the emigrants are lodged in special halls where they undergo another examination by physicians employed by the navigation companies before they are allowed to go on board ship. As the actual time of transit from the frontier to Hamburg or Bremen is about 24 hours it will be seen that with the delays resulting from the several inspections and the fact that ships do not depart daily, there is in fact, though not in name, a quarantine of from two days to a week before the emigrant can sail, during every day of which he is prevented from mixing with the general population and is under the observation of physicians and guards.

The first control stations erected were very simple and offered little more than a shelter to physicians and disinfecting apparatus. These are, however, being replaced from year to year by more modern plants containing not only facilities for sanitary operations, but clean and airy dormitories with a separate hospital for infectious diseases. Taking the stations in geographical order and beginning at Bajohren, on the extreme northeastern frontier, they may be described as follows:

1. *Bajohren.*—The first station was a mere shed erected in 1894, which was replaced in 1904 by a new station containing sleeping accommodations. In this station there is a board flooring throughout, although in the new building just finished and in which the sanitary operations are carried on there is a cement floor.

2. *Insterburg.*—This is one of the old stations and is comparatively unimportant.

3. *Tilsitt.*—This is also an old station, the traffic through which is rather limited.

4. *Eydtkuhnen.*—This station has been in use for only a few months, and is the best adapted to its purposes on the frontier. The premises are said to be kept scrupulously clean throughout.

5. *Prostken.*—At this station there is a substantial building with wooden floors throughout. The station was completed in 1906, and is one of the most important control stations on the frontier.

6. *Illowo.*—Station completed in 1906, and to all intents and purposes is equipped in a manner similar to the one at Prostken.

7. *Ottlotschin.*—This is an old station without dormitories, emigrants being obliged to sleep on the floor and provide themselves with bedding. A new station is being built and is about to be opened at Thorn, a few miles distant. The said station when ready will replace the Ottlotschin station.

8. *Posen.*—The old station at Posen is in a very insanitary condition, but fortunately has just recently been replaced by a new station with cement floors and all modern sanitary conveniences.

9. *Ostrowo.*—A new station finished in 1906, meeting all requirements.

10. *Myslowitz.*—Station finished in 1906, and being improved at the present time. This is a very busy station and one which receives not only Russian but all the Austrian immigration which reaches German ports. It is stated that the drinking water used at the station is obtained from wells driven into the premises, and it is presumed that this water is pure for the reason that no reports have ever been made of disease resulting from its use.

Regulations for the physicians at the control stations on the Russo-Prussian frontier, approved by the Government.

(1) The physicians are employed by the central administration of the control stations; but in regard to the hours of daily service and all service work, they will be governed by the director of the control station.

(2) The physicians will procure from the central administration such necessary information and instruments as may be necessary for their preparations for the examination of emigrants, and for the handling of such as may be sick in the control-station lazarettes.

(3) The physicians must request leave of absence of the central administration with the consent of the director of the control station.

(4) The physicians are compelled to inspect all the emigrants who are admitted to the control station as soon as possible after their arrival.

For this purpose all emigrants will be brought before the control-station physician singly, and when the physician deems it indispensable and it can be done without injury to the sense of shame, in an unclothed condition. (Not now enforced.—(R. P. S.)

(5) The inspection must extend to skin itches, fresh smallpox scars, syphilis, hair favus, herpes, tonsurans, and similar diseases; eye trachoma, throat diphtheria, etc., and any possible ailments such as deafness, dumbness, etc. Further, it has to be ascertained whether the bodily heat is abnormal and a physical examination, although but hasty, of the respiratory organs must be made.

In case there exists the suspicion of a feverish disease, the bodily temperature must be taken with a fever thermometer, and this, if done in the morning, must be repeated at night.

(6) The instruments used for uplifting the eyelids and for the inspection of the throat must be thoroughly cleaned and disinfected after each individual use.

(7) Whether the emigrant must take a bath is determined by the physician. (Bathing practically abandoned.—R. P. S.)

Generally, only those emigrants have to take a bath as are so dirty that their bodily inspection is thereby hindered, or those suffering from itch or any other skin disease, or showing smallpox scars. Aside from this, each emigrant must be given an opportunity to bathe, if desired.

(8) Whether the underwear and clothing of the emigrant must undergo disinfection is determined by the physician.

Generally the disinfection can be limited to:

(*a*) Dirty linen carried in their baggage, but not linen worn by the emigrants. (There is no disinfection at present.—R. P. S.)

(*b*) The clothes of those immigrants showing fresh pock marks or who are suffering from the itch.

(*c*) Clothing of such individuals as are suffering from an acute contagious disease: Cholera, diphtheria, chicken pox (fleckenfieber), contagious cerebro spinal menigitis, measles, smallpox, febris recurrens, contagious diarrhea, scarlet fever, or typhoid fever.

(9) Those emigrants are excluded from transportation who suffer from one of the diseases, or are suspected to be suffering therefrom, mentioned in the "Epidemic law of the Empire" or the "Prussian epidemic law (Reichsseuchengesetz oder das preussische Seuchengesetz), with the provision that sufferers from trachoma are to be excluded only as long as they suffer from a purulent secretion. Further, those emigrants suffering from a chronic skin disease, excepting itch, from a chronic hair disease, as, for instance, favus or any other severe bodily ailment, have to be excluded.

Furthermore, the physician must bring such cases to the attention of the manager of the control station, and these patients must be considered nonadmissible under the conditions of the transoceanic States, according to information from the central management of the control stations.

(10) Emigrants afflicted with an acute feverish illness such as is mentioned in paragraph 8 (*c*) are to be transferred to the hospital of the control station. Emigrants who have been in personal contact with a sufferer from cholera, typhoid fever, plague, or smallpox must always be considered as suspects.

(11) Any remarks about the inspection must be entered by the physicians in their own handwriting on lists and control slips which are supplied to them for this purpose. These control slips must be signed; the use of a stamp is not permitted.

(12) The infection with or death from one of the diseases of the "Reichsseuchengesetz"—leprosy, cholera, typhoid fever, yellow fever, plague, and smallpox, or patients suspected to be infected with one of these diseases; or with one of those mentioned in the "Preussischen Seuchengesetz"—diphtheria, contagious cerebro spinal meningitis, puerperal fever, trachoma, febris recurrens, contagious diarrhea, scarlet fever, typhoid fever, hypochondriac disease, Rotz hydrophobia, meat, fish, and sausage poisoning, trichinose, must at once be reported to the police of the place by the physician of the control station, on the printed forms prescribed.

Immediately after examination the physician of the control station must give to the manager a specific statement with all the names of the passengers detained.

(13) The physicians have to keep the following lists:

(*a*) A list with the names of all persons excluded from transportation on account of sickness.

(*b*) A list giving the names of all those emigrants who have been transferred to the station's hospital on account of sickness (hospital journal), in which brief remarks as to the proceedings and the final result must also be made.

RUSSIAN EMIGRATION VIA LIBAU AND ENGLISH PORTS.

The only Russian port from which emigrants sail direct to the United States (New York) is Libau, in the northwestern corner of Russia, on the Baltic. Here for several years past and at present the service maintains a medical officer in the office of the United States consul, who carefully enforces the Treasury regulations.

On account of the restrictions at the German ports, as the bureau learned early in the summer, emigration was being deflected to Libau, and to avoid restrictions at the latter port the emigrants were taking passage to London, Liverpool, or other British ports. This could not be prevented, as the vessels on which they embarked were not bound for the United States, and therefore required no United States consular bill of health. Arrived in England, the immigrants thought no restrictions would be placed on their taking passage to the United States. This situation, however, was met by an order from the State Department, sent to all consuls in England at the request of the Treasury Department, November 8, 1910, requiring the usual five days' detention and observation of all such immigrants at the English ports, and this order was carried out.

RUSSIAN EMIGRATION VIA OTHER EUROPEAN PORTS.

As shown in the last annual report, pages 86, 87, and 88, the detention in the summer and fall of 1910, required by paragraphs 29, 30, and 31 of the general quaratine regulations, was being enforced with reference to all Russian steerage passengers at every European port at which they embarked for the United States. This remained in force until April 1, 1911, when, on account of the subsidence of cholera in Russia, the measure was modified by the following cable sent by the State Department on the request of the Secretary of the Treasury to consular officers abroad:

> Detention of immigrants for the United States no longer required on account of cholera unless from known cholera-infected districts.

This order regarding Russian immigration remained in force during the season of 1911, but practically all Russian immigrants were detained at ports of embarkation, and all were subjected to the bacteriological examination at ports in the United States.

FOREIGN MEASURES AGAINST THE ITALIAN EPIDEMIC.

The cholera, which had subsided in Italy during the winter, was again announced June 8, 1911, and became more prevalent than during the preceding summer. From June 8 to October 7, 1911, 14,821 cases have been reported, with 5,486 deaths.

For a time it was possible to distinguish at Italian ports a departure those emigrants who came from infected districts, these districts being, generally speaking, in southern and central Italy. Later the wider distribution of the disease made this impossible, and an order was issued September 25, 1911, requiring detention and observation of Italian steerage passengers sailing from any port of Italy. To prevent a deflection of said passengers to ports of other countries for embarkation, as Marseille and Havre, the order was extended in application to Italian steerage sailing from any foreign port.

The chief ports of danger were at first Naples and Palermo. and later Genoa, Messina, and Catania.

At Naples and Palermo, in addition to other precautions, bacteriological examinations were made by the Italian authorities to prevent cholera carriers taking passage. It is learned unofficiallv that 40 carriers of cholera were detected at Naples.

On account of these examinations, the suggestion was made to the bureau to accept such immigrants as had been examined in the foreign ports and waive the examination required in the United States ports. The suggestion was not seriously considered, for while the bureau was pleased with this foreign precaution, it was unwilling to rely on such examinations unless made on this side under its own direction or observation.

The arrival in New York of vessels on which cholera appeared, notwithstanding the restrictions at Naples, indicated either that fraud had been perpetrated as to the locality in Italy from which the immigrants came, or that infected localities existed which had not been reported. This gave additional reason for detaining all Italian immigrants abroad as heretofore stated.

In addition to the detention for five days and disinfection of the baggage of immigrants, every measure possible was put into effect to eliminate from the baggage of steerage passengers food products, such as cheese, sausages, bottled water, etc. Not only was the necessity for this measure impressed upon the steamship officials at a meeting of the Trans-Atlantic conferences, but the quarantine officers at United States ports, and also medical officers of the service engaged in the examination of aliens, were directed to search the baggage of immigrants to further supplement the important work of keeping from this country foodstuffs which had been carried in the personal baggage of immigrants from cholera-infected places. At first considerable difficulty was experienced in carrying out this work. It was found that at the foreign ports of embarkation after foodstuffs were discovered in the hand baggage of outgoing passengers and confiscated, more of similar supplies would be purchased from bumboats prior to the actual departure of the vessels, but the finding at United States ports and the subsequent confiscation of foodstuffs finally had the effect of deterring steerage passengers from any attempt to purchase such articles.

The cooperation of the Transatlantic Steamship Conference, not only in connection with the work of eliminating foodstuffs from baggage, but also in all instances where their cooperation was required, is deserving of special mention.

In the enforcement of these foreign regulations the service had its own medical officers at Naples, Genoa, Palermo, Messina, and Catania in Italy, Marseille in France, and Libau, Russia. At the other German and French ports details of medical officers did not become necessary. These ports had been inspected by an experienced officer of the service less than a year previous, and the consuls at all of them were reported as being active in the enforcement of the regulations. The intelligent cooperation of the consuls during the past season has been manifested also in their dispatches, and to them and to the Consular Bureau of the State Department is due acknowledgment of a hearty support of this bureau.

MEASURES ENFORCED AT SEA.

The quarantine regulations provide certain sanitary requirements to be observed at sea by masters of vessels bound to the United States, and special instructions in the event of the appearance of any contagious or infectious disease, including, of course, cholera. These requirements are set forth in detail in paragraphs 46 to 50 of the book of regulations. They were also printed in full in the last annual report, and are therefore not reprinted here.

There was evidenced a desire on the part of ships' agents, masters, and ships' surgeons to comply with these requirements. But with regard to Italian immigrants, the information furnished the American quarantine officers by the Italian royal commissioners and the precautionary measures enforced by them while the vessel was at sea were of particular value.

COOPERATION OF THE ITALIAN ROYAL COMMISSIONERS.

On every Italian vessel carrying immigrants a royal commissioner, who is on the active list of the medical corps of the Italian Navy, is detailed, who, besides his duties of seeing that the Italian immigrant regulations are carried out, is charged with certain sanitary duties. These commissioners exercise their duties on vessels outward bound from Italy, and also on the return voyage. The reports of the said commissioners have legal value at the Italian port, just as though they had been drawn up by a law officer, according to the penal code or police laws of Italy. The use of these commissioners, as outlined above, has been in vogue for about 10 years. In the event that there are not enough naval surgeons available to cover all the ships surgeons of the army are detailed, and exceptionally army or navy officers are detailed who are not physicians.

Their sanitary duties consists of reports to their superior officer, the royal commissioner of immigration, of every case of infectious disease occurring amongst immigrants, or every case presenting suspicion of infectious disease. These traveling commissioners have had special orders issued to them during the last year in connection with cholera. These orders gave exclusive directions as to hygienic and disciplinary measures which should be enforced aboard vessels for the early detection of a case of cholera occurring on a voyage, and for the confirmation of the diagnosis, and the necessary quarantine measures which should be enforced prior to the arrival of the vessel at its point of destination. They were instructed to keep all material from cases of diarrhea occurring on board, and also of any cases of death occurring at sea, and provision was made for the sending of a wireless message to Italy or to the Italian consulates at the port of destination, so that the presence of cholera on board a vessel could be known before its arrival. In order that the material for diagnostic purposes could be properly kept during the voyage, a small refrigerator was provided for each commissioner, and in addition to this a small bacteriological outfit.

In anticipation of the valuable service which these royal commissioners would render to the quarantine officers stationed at the various United States ports, a letter was addressed to the State Department from the Department of the Treasury on February 8, 1911, in which the good offices of the State Department were requested in arranging for these royal commissioners to render reports concerning the health of and all details of any sickness occurring in Italian immigrants during the voyage, to the quarantine officers at New York, Boston, Philadelphia, and New Orleans. The Italian Government, in a letter dated April 11, 1911, addressed to the United States ambassador at Rome, gave its consent to the above request, and since that time the royal commissioners have been rendering reports to the quarantine officers. The value of their work was shown in the case of the Italian steamer *Duca degli Abruzzi*, from which vessel cases of cholera were removed at the New York quarantine. The royal commissioner on the above-named vessel, by preserving the material from a case of a child who died at sea, enabled the quarantine officer at the port of New York to make a diagnosis of a case of cholera occurring on board, which otherwise could not have been bacteriologically confirmed. In general it may be said that the aid rendered by the commissioners has been of a very high order, and their services have received much commendation.

SPECIAL QUARANTINE MEASURES IN THE UNITED STATES.

Upon the arrival of vessels from cholera-infected ports or from ports from which persons from infected districts embarked, the vessel, together with the personnel and passengers, are subjected to a careful inspection. This includes a personal inspection of the individual, an examination of any person ill, and a microscopical examination of the stools of the steerage passengers, and under certain circumstances of the crews, for the purpose of detecting the presence of the cholera spirilli.

The above measures were inaugurated in compliance with the terms of the following department circulars, Nos. 45 and 47:

ADDITIONAL MEASURES AGAINST IMPORTATION OF CHOLERA.

[1911. Department Circular No. 45. Bureau of P. H. and M. H. S.]

TREASURY DEPARTMENT, OFFICE OF THE SECRETARY,
Washington, July 6, 1911.

To National, State, and local quarantine officers, collectors of customs, shipowners and agents, and others concerned:

The following additions to the quarantine regulations of the Treasury Department, issued October 20, 1910, under the act of Congress approved February 15, 1893, are hereby promulgated and shall remain in force until otherwise ordered:

CHOLERA-BACILLUS CARRIERS.

To diminish the danger from cholera-bacillus carriers, steerage passengers coming from ports or places where cholera prevails and arriving on vessels upon which cholera has appeared, shall be detained 10 days for observation unless after 5 days' detention they are found not to be bacillus carriers.

The same provision shall also apply to other persons arriving on said vessels who, for special reasons, are deemed liable to be thus infected.

FOOD PRODUCTS BROUGHT BY STEERAGE PASSENGERS FROM PORTS OR PLACES INFECTED WITH CHOLERA.

Attention is called to paragraph 27 of the special regulations on account of cholera, to be enforced at foreign ports, which provides as follows:

"27. Certain food products, viz, unsalted meats, sausages, dressed poultry, fresh butter, fresh milk (unsterilized), fresh cheese coming from cholera-infected localities or through such localities, if exposed to infection therein, should not be shipped. Fresh fruits and vegetables, from districts where cholera prevails, shall be shipped only under such sanitary supervision as will enable the inspector to certify that they have not been exposed to infection."

At domestic ports, to supplement the above regulations, it is hereby ordered that food products brought by steerage passengers or members of the crew from ports or places where cholera prevails, in violation of paragraph 27, quarantine regulations, whether brought in trunks, hand baggage, or on the persons of immigrants or members of the crew, shall be removed to the quarantine station. Said food products and others, including water supplies, which, in the opinion of the quarantine officer, may be infected, shall be destroyed or held until, by careful examination, it is determined that they are free from infection, and if allowed entry must be accompanied by a written certificate in each case.

R. O. BAILEY, *Acting Secretary.*

CHOLERA-BACILLUS CARRIERS.

[1911. Department Circular No. 47. Bureau of P. H. and M. H. S.]

TREASURY DEPARTMENT, OFFICE OF THE SECRETARY,
Washington, July 19, 1911.

To National, State, and local quarantine officers, collectors of customs, shipowners and agents, and others concerned:

In accordance with the act of Congress approved February 15, 1893, and to further prevent the entrance of cholera into the United States, the following regulation, in addition to those contained in quarantine regulations of the Treasury Department issued October 20, 1910, and in Department Circular No. 45, July 6, 1911, is hereby promulgated, and shall remain in force until otherwise ordered:

"All steerage passengers arriving at ports in the United States from ports or places infected with cholera shall be subjected to bacteriological examination and shall not be admitted to entry until it has been determined by said examination that they are not cholera-bacillus carriers."

FRANKLIN MACVEAGH, *Secretary.*

For the purpose of preventing steerage passengers from cholera infected districts in Europe from evading the bacteriological examination required at the United States ports of entry a request was addressed on July 28 to Dr. Montizambert, director of public health of Canada, to apply bacteriological examination to Italian steerage passengers coming to the United States by way of Canada to determine whether such passengers were bacillus carriers. In response Dr. Montizambert stated July 29 that a ministerial order had been issued providing for bacteriological examination of all Italian steerage passengers before admission to Canada for the purpose of excluding bacillus carriers, and that a bacteriologist had been appointed at Grosse Isle quarantine station, Quebec, and that others would be appointed at Halifax and St. Johns. He also forwarded the following circular:

CIRCULAR TO QUARANTINE OFFICERS, THE COMMISSIONER OF CUSTOMS, SHIPOWNERS, AGENTS, AND OTHERS CONCERNED.

OFFICE OF THE DIRECTOR GENERAL OF PUBLIC HEALTH,
Ottawa, Canada, July 27, 1911.

SIR OR SIRS: I am directed by the honorable the minister of agriculture to inform you that, in order to diminish the danger of the introduction of Asiatic cholera into this country, he has issued the following orders:

All steerage passengers arriving at ports in Canada from ports or places infected with cholera shall be subject to bacteriological examination at the quarantine station of the port and shall not be permitted to pass such station or to make customs entry until it has been determined by such examination that they are not cholera-bacillus carriers. This regulation shall apply until further notice to steerage passengers from Italy coming directly or via intermediate ports.

For all cholera contacts arriving on vessels upon which cholera has occurred, the period of detention under quarantine observation shall be 10 days, unless after 5 days' detention they are found not to be cholera-bacillus carriers.

Your obedient servant,

F. MONTIZAMBERT,
Director General of Public Health.

SPECIAL PROTECTIVE MEASURES GOVERNING ORGANIZATION.

July 15 to 22 Asst. Surg. Gen. L. E. Cofer was under detail to visit New York and Boston, with a view to the inauguration of the important measures set forth in Department Circular No. 47, July 19, 1911, published in Public Health Reports July 21, requiring bacteriological examination of every steerage passenger from a cholera-infected port or place.

Conferences were held between himself, Dr. Alvah H. Doty, health officer of the port, Dr. Ernst J. Lederle, commissioner of health, Dr. Hermann M. Biggs, general medical officer, and Mayor Gaynor, the result of the conference being that the municipal health authorities would render the necessary aid in the bacteriological examination of arriving immigrants at the port of New York.

Drs. Biggs and Cofer then proceeded to Albany, July 19, for a conference with the governor and the State department of health with the result that a staff of bacteriologists was sent from Albany to quarantine to aid in the said examinations.

Dr. Cofer then proceeded to Boston, where like arrangements were made with Dr. S. H. Durgin, chairman of the board of health, who announced a determination to put the provisions of the circular into effect and that he would furnish the necessary bacteriological force for doing so.

Conferences were also held in Boston July 20 with Dr. Eugene P. King, quarantine officer of the port of Providence, at which port vessels of a new line of steamships are expected to arrive from the Mediterranean, and an agreement was effected for like bacteriological examinations at that port.

On July 21 Dr. Cofer on his return stopped in New York and conferred with the agents of the steamship lines, and was instructed to urge upon them that they direct their agents in foreign ports to assist in the enforcement of the Treasury regulations provided for said ports, particularly at Naples and Palermo, and in the exclusion of foodstuffs and bottled water from the baggage of immigrants. Their attention was called to the absolute necessity of preventing the sale of such articles from bumboat men to the immigrants on the vessels as they lie in the harbor before sailing, and it was suggested further that they advise their agents not to accept immigrants from infected ports or places for transportation to the United States in order to prevent congestion at the New York quarantine. The steamship agents agreed to cooperate to the extent of their ability, and have acted upon the suggestions made.

The bureau had as its representative in Boston Passed Asst. Surg. A. J. McLaughlin, recently acting director of public health in the Philippines and in charge of suppressive measures in the cholera epidemic in Manila in 1908. He is engaged in assisting Health Commissioner Durgin in the investigations regarding possible bacillus carriers, and was also detailed, under paragraph 149 of the United States Quarantine Regulations, as inspector of the local quarantine. Upon the arrival of vessels at Providence, as it is but one hour's journey from Boston, he exercised a like function at that quarantine station.

At New York Passed Asst. Surg. R. H. von Ezdorf, under like detail, is the representative of the service, and Passed Asst. Surg. R. H. Creel is assisting in the bacteriological examinations.

The following plan was outlined by Dr. McLaughlin and faithfully carried out by the local authorities at Boston and Providence:

Quarantine station.—The immigrants were divided in groups of about 200 persons, the women and children housed in the permanent barracks and the men in tents. The unit groups were separated by lines patrolled by police or guards, and the groups were distinguished by tags of different colors. The fecal specimens were secured by the administration of epsom salts to the adults, except those who had diarrhea. Specimens were obtained from those suffering from diarrhea and from all children by means of a rectal tube. Specimens were collected from the women and children by trained nurses.

The simplest way of handling and disposing of the stools was to issue sanitary cuspidors of paper instead of night vessels. After inoculating the peptone solution from the fecal material, the immigrant's name was entered in a book and a number given him. This number was placed on his colored tag and also on the peptone tube. The stool in the paper cuspidor was dropped in a flour barrel. When the flour barel was full the cover was placed and barrel and contents burned. The peptone tubes were brought to the laboratory for incubation.

Laboratory methods.—The peptone tubes were incubated for about six hours at a temperature of 35° to 37° C. Smears were made from the surface by placing several drops in the center of the slide, drying slowly without spreading. The smears were fixed and stained with dilute carbol fuchsin. Prepared in this way the organisms are concentrated and the number in each field increased. The specimen is searched systematically, using a mechanical stage and covering from 25 to 50 fields. If no curved organisms or vibrios are encountered the specimen is considered negative. If vibrios are found, a second peptone culture is made from the first and plates are made. The vibria colonies on the plates are tested for agglutination by specific cholera serum.

This procedure enables each man to examine 100 specimens daily. In Boston with 10 men 1,000 specimens were examined in one day without difficulty or confusion. By employing these methods a ship upon which no cholera is found may be discharged in 48 hours; and if a carrier is found, the group of which he is a member need only be detained, the other noninfected groups being discharged on the second day. A greater measure of protection is afforded than is possible under the old detention procedures, and several days' unnecessary detention avoided.

At Providence practically the same methods were employed. There was this difference however. Providence has no quarantine station and no barracks available for detention. The whole proceedure was carried out on shipboard.

On August 12 Passed Asst. Surg. McLaughlin was ordered to New York for the purpose of securing uniformity of methods to expedite the bacteriologic examination and shorten detention.

At the present time Boston and New York are the sole ports of entry for the arrival of immigrants from the Mediterranean. Immigrants destined for Philadelphia arrive first at New York and subsequently are carried around by the same steamer to Philadelphia. The quarantine procedure in regard to these immigrants under the law must be carried out at the port of New York, which is the first port of entry, the vessel afterwards being coastwise. It is customary, however, to detail an officer of the service to accompany these vessels from New York to Philadelphia as an additional safeguard.

QUARANTINE AGAINST CHOLERA AT THE PORT OF NEW YORK, N. Y.

[Reported by Passed Asst. Surg. R. H. Von Ezdorf through the courtesy of Quarantine Officer A. H. Doty.]

During the period between June 13 and October 1, 1911, there arrived at New York 10 vessels upon which cases of cholera appeared, and 1 vessel with a clean history upon which 2 healthy cholera carriers were found.

A total of 35 cases of cholera with 20 deaths was reported, of which 11 cases with 6 deaths occurred in June, 17 cases with 9 deaths during July, and 7 cases with 5 deaths during August.

These cases occurred as follows:

	Cases.	Deaths.	Recovered.
On vessels at sea	12	7	5
Arriving on vessels at quarantine	6	2	4
Developing at quarantine	13	8	5
Developing in New York and vicinity	4	3	1
Total	35	20	15

Of the 13 cases developing at quarantine, 1 was in a person who had come in contact with passengers detained from an infected vessel, among whom cases of cholera developed while in detention, and whose infection was therefore contracted while in detention at Hoffmann Island; the remainder occurred in passengers who were in detention from infected vessels, namely, 1 from the *Duca degli Abruzzi* and 11 among the detains from the *Moltke*.

Of the 4 cases developing at New York and vicinity, 2 were passengers who arrived on an infected vessel, 1 developing at Brooklyn, 1 at Auburn; 1 was in a discharged quarantine employee developing on Staten Island, and 1 was in a Spaniard who had resided in New York City two weeks and whose infection could not be traced to any vessel coming from an infected port.

The first 3 cases mentioned occurred prior to the routine examination made of persons for carriers, and would probably have been detected if their release from quarantine had been made dependent upon such examination.

Of the total number of 35 cases, 1 was not confirmed bacteriologically, though the case was so diagnosed clinically; 2 were not confirmed because of lack of specimens, but were undoubted clinical cases—both were fatal cases—and were buried without specimens or dejecta being preserved; 3 were diagnosed as cholera by the examination of the patients' blood by means of an agglutination test made against a known cholera vibrio; and in the remaining 29 cases the cholera vibrio was isolated.

List of the infected vessels arriving at New York.

Name of vessel.	Date of arrival.	Cases of cholera on vessels.				Occurring at quarantine.		Examinations for carriers.		Carriers found.		Reexaminations.		Carriers found on reexaminations.
		At sea.		On arrival.										
		Passengers.	Crew.	Passengers.	Crew.	Passengers.	Crew.	Passengers.	Crew.	Passengers.	Crew.	Passengers.	Crew.	
Berlin	June 13	[1] 1												
Europa	June 14			1										
Duca degli Abruzzi	June 20	[2] 1		3		1								
Laura	June 21	[3] 2												
Moltke	July 5		[4] 1			11		201	51	15	3			0
Perugia	July 15	[5] 1	[5] 1					257	30					
Venezia	Aug. 11	[1] 1						681	93	1		147		0
Konig Albert	Aug. 17				1			359	190		1		53	0
Re d'Italia	Aug. 18	[1] 3			1			259	122	1		258		0
Europa	Aug. 25		1					346	126					
Duca di Genova [6]	July 30							546	1	2				

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[1] Died at sea.

[2] In addition, 2 passengers developed cholera after discharge from quarantine—1 at Brooklyn and 1 at Auburn, N. Y.

[3] Recovered before arrival.

[4] Case in member of crew diagnosed on agglutinability of patient's blood; vibrio not isolated.

[5] Cases of cholera diagnosed on agglutinability of patient's blood. One stowaway also examined bacteriologically.

[6] Vessel 10 days in quarantine. No sickness, suspicious of cholera, occurred during the voyage or while in quarantine.

One quarantine employee contracted cholera developed on Staten Island.

Examinations for carriers began July 16, 1911.

Twenty-seven cholera vibrio carriers—22 in the month of July and 5 in the month of August—were reported during the period from July 16, 1911, when the examination for carriers was first instituted, to October 1, 1911.

Of the 27 carriers reported, 18 were found among the passengers (15) and crew (3) in detention at Hoffmann Island from the steamship *Moltke;* 3 were found among persons who were in detention at Hoffmann Island during the period and associated with passengers from the steamship *Moltke.*

One occurred in a quarantine employee on Hoffmann Island; and in a total of 11,240 passengers, 602 members of crews, 9 stowaways examined bacteriologically, arriving on 34 vessels beginning with the steamship *Perugia*, which arrived July 15, to October 1, 1911, 5 carriers were found, as follows:

Two were found on the *Duca di Genova*, arriving July 30, among 546 passengers examined, and among whom no illness suspicious of cholera occurred during the voyage or while in detention 10 days; 1 each on the steamships *Venezia*, *Konig Albert*, and *Re d'Italia*, on which vessels cases of cholera had occurred.

One carrier only, that of a child 4 years old, developed choleraic symptoms which lasted one day and from which it recovered. This case should be included in the cholera cases, but it was first reported among the carriers.

All cholera cases, after clinical recovery, and all cholera vibrio carriers were examined to ascertain the continued presence of the cholera vibrio in the dejecta, and were not discharged until 2 or 3 successive examinations at 2 or more days intervals proved negative.

The time elapsing among carriers from the date of the first positive findings to the date of discharge was, 1 in 9 days; 1 in 10 days; 1 in 13 days; 5 in 14 days; 3 in 15 days; 1 in 16 days; 3 in 17 days; 3 in 19 days; 1 in 21 days; 3 in 22 days; 1 in 23 days; 1 in 25 days; 1 in 28 days; and 2 not definite, one of these in an employee, and the other in a passenger discharged from quarantine detention who was afterwards found to be a carrier. The case was traced to Yonkers where isolation, disinfection, and observation of contacts was carried out by the State health authorities and the case discharged after reexaminations of specimens obtained July 28 and 29, 1911, proved negative. The error occurred in checking the laboratory numbers with the manifest numbers.

Vessels examined.

Name of vessel.	Date of arrival.	Number examined for carriers.	Date discharge from quarantine.	Remarks.
			1911.	
Perugia	July 15	259 steerage, 30 crew, 3 stowaways.	July 24	Arrived infected.
Principe di Piemonte	July 20	316 steerage	July 26	
Oceania	July 25	468 steerage	July 29	
Berlin	July 26	654 steerage	July 31	
Verona	July 27	332 steerage	Aug. 2	
Duca di Genova	July 30	546 steerage	Aug. 8	2 carriers found.
Luisiana	Aug. 6	242 steerage	Aug. 9	
Calabria	Aug. 11	365 steerage	Aug. 14	
Venezia	...do...	681 steerage, 93 crew, 147 steerage reexamined.	Aug. 15	Arrived infected; 1 carrier found.
Duca degli Abruzzi	Aug. 14	298 steerage	Aug. 16	
Konig Albert	Aug. 17	359 steerage, 190 crew, 53 crew reexamined.	Aug. 21	Arrived infected; 1 carrier in crew found.
Re d' Italia	Aug. 18	259 steerage, 122 crew, 258 steerage reexamined.	...do...	Arrived infected; 1 carrier in passenger found.
Taormina	Aug. 22	312 steerage	Aug. 24	
Europa	Aug. 25	346 steerage, 126 crew	Aug. 26	Arrived infected; no carriers found.
Duca D'Aosta	Aug. 30	416 steerage, 1 cabin, 1 stowaway.	Aug. 31	
Sant'Anna	Aug. 31	472 steerage, 2 cabin, 1 crew, 1 stowaway.	Sept. 1	
Columbia	...do...	213 steerage from Trieste and Patras.	...do...	
Martha Washington	Sept. 4	184 steerage from Trieste	Sept. 5	
America	Sept. 6	155 steerage	Sept. 7	
Verona	...do...	86 steerage, 2 cabin, 1 crew	...do...	
Italia	Sept. 6	371 steerage	Sept. 8	
Mendoza	Sept. 8	149 steerage	Sept. 9	
Duca di Genova	Sept. 10	513 steerage, 1 stowaway	Sept. 12	
San Giorgio	Sept. 12	547 steerage, 1 crew	Sept. 14	
Prinzess Irene	Sept. 13	287 steerage	...do...	
Cretic	Sept. 15	323 steerage, 4 crew	Sept. 16	
Oceania	Sept. 16	306 steerage, 8 second cabin	Sept. 17	
Hamburg	Sept. 19	250 steerage, 1 second cabin, 10 crew.	Sept. 20	
Madonna	...do...	46 steerage from Marseilles, 1 crew.	...do...	
Principe di Piemonte	Sept. 20	330 steerage, 1 stowaway	Sept. 21	
Perugia	Sept. 22	177 steerage, 1 crew (with smallpox).	Sept. 23	
Duca degli Abruzzi	Sept. 25	415 steerage, 1 crew	Sept. 26	
Konig Albert	Sept. 28	344 steerage, 21 crew	Sept. 29	
San Giovanni	...do...	205 steerage, 2 stowaways	...do...	
La Savoie	Sept. 30	450 steerage	....	From Havre, negative on Oct. 1.

Total, 11,690 steerage; 602 crew; 9 stowaways; 405 steerage reexamined and 53 crew reexamined.

To carry out the measures contained in the new regulations, Department Circulars Nos. 45 and 47, an immediate increase of the quarantine laboratory force and men trained in bacteriology was made. The quarantine laboratory is under the direction of Dr. E. C. Baldwin.

The New York State laboratory sent a traveling laboratory outfit, which was installed, together with a force of three bacteriologists and assistants.

Passed Asst. Surg. A. M. Stimson, of the Hygienic Laboratory, United States Public Health and Marine-Hospital Service, rendered assistance for several days and was succeeded by Passed Asst. Surg. R. H. Creel, of the Hygienic Laboratory, who has been on duty since July 20, 1911. Since August 8 the status of Passed Asst. Surg. Creel, in addition to his assisting in the bacteriological examinations, was considered to be that of a consultant in passing on cultures for final decision, whether positive or negative, for cholera.

.The city research laboratory, of the New York department of health, under the direction of Dr. William Park, also assisted in making examinations of all specimens sent there. It was contemplated that by this means 100 specimens per day would be examined by the said laboratory and 100 per day by the quarantine laboratory. These numbers were greatly exceeded when everything was in running order.

QUARANTINE PROCEDURE AT THE NEW YORK QUARANTINE STATION.

Upon the arrival of a noninfected vessel carrying passengers from cholera-infected ports the vessel is boarded, an inspection made, and a most careful history regarding all illness which has occurred during the voyage obtained. Specimens are obtained from all persons who have been under treatment in the hospital, unless apparent that the ailment could not possibly have any connection with cholera, which are termed "specials," for immediate laboratory examination.

If there has been no sickness among the cabin passengers, and the preliminary examination of the "specials" (which consists in a direct examination of specimens and of the original cultures), proves negative, they are released at once and allowed to land. By this method every case of illness which has occurred on the voyage is classed as suspicious until proved otherwise.

The procedure before obtaining specimens from the steerage passengers is as follows:

Cards are furnished the purser, who is requested to make out one for each passenger according to the manifest, giving the name, age, sex, manifest number, and name of the vessel.

The men and women passengers are then separated, the boys under 12 years of age accompanying their mothers.

The hospital or other suitable room is curtained off so that the obtaining of a specimen may be made as private as possible.

The test tubes, with cotton swabs, which have been sterilized, and envelopes are prepared on shore and taken aboard by the medical officers attached to the laboratory.

All being in readiness, the individual passenger presents himself, shows his inspection card, and the special card which has been prepared for him is given him when he enters the room. The cotton swab, which is moistened by dipping into a sterile tube of peptone solution, is now used in taking the specimen direct from the rectum, and the tube with the swab specimen is placed in the envelope, together with the special card with which the passenger was furnished on entering.

Specimens may be taken by this method from approximately 200 men or 125 women and children in one hour.

The envelopes are then brought to the laboratory, where the cards are numbered on being removed from the envelopes with the specimen tubes, and inoculations made into Dunham's peptone media at once, which tubes are given corresponding numbers as those on the cards.

The procedure has been recently modified so that swabs as soon as taken are dropped directly into the peptone tubes, which have been previously numbered, and the corresponding number recorded on the special card of the individual. These original tubes are brought ashore and incubated.

Subcultures are made from the original tubes at the end of six hours, and from these subcultures, 6 to 8 hours old, smears are made, which are stained with carbol-fuchsin solution diluted to 10 per cent of the original strength, and examined for vibrios. Each bacteriologist examines approximately 100 ready-prepared stained specimens in three to four hours.

Should a vibrio be found, plates are made on agar, and the colonies studied, and an agglutination test made with specific serum, the macroscopic method being used at 1-200. This should give an instantaneous reaction if it is cholera. A control with normal serum is always made.

All examinations proving negative, the vessel is released. If a carrier is found, the passengers are removed to the detention barracks at Hoffmann Island, where they are segregated into three groups, the carrier being sent to Swinburne Island. The detains are again examined bacteriologically before the expiration of the five days.

The conditions on infected vessels are carefully studied and treated individually. No particular method of procedure can be given further than that an examination for carriers on the same lines given for noninfected vessels is made of the steerage and crew.

In the experience of practical cholera workers, it seems that this examination could safely be begun 48 hours after the removal of the carrier, as it is believed that the vibrio would make its appearance in the dejecta or lower intestine by that time.

Some objections have been raised to adopting the use of cathartics on board vessels for obtaining stools or dejecta because of the limited toilet accommodations, because of the possible spread of infectious material if present, and because ordinary personal cleanliness might be neglected from frequent action of a cathartic or saline. More attendants would be required and a careful watch kept over each individual entering the toilet until the specimen is obtained, besides there might be some delay in obtaining action from the purge.

In favor of the direct method of obtaining specimens it may be said that it is more expeditious in that a specimen can be obtained more rapidly and within a short time after the arrival of the vessel. It is probably a less satisfactory specimen than that obtained from the stool, yet this can be overcome if the individual is given a purge a day before arrival. An equally good result could be obtained by using the direct swab method immediately after the action of a saline, thereby avoiding the handling of a stool.

Another method is also being tried. A small glass tube open at both ends, containing the swab, has been used for insertion into the rectum in the manner of a speculum, and after introduction the swab passed beyond the tubal end for removal of a specimen. The result shows a considerably larger amount of material obtained, besides being apparently safer and easier of application.

That the direct swab method is efficient has been demonstrated in the results thus far obtained.

Should a vibrio or curved organism be found which in the mixed culture may show on test with specific serum a partial agglutination in a hanging drop, the person is removed into isolation at once pending the further examination of the vibrio. Thus, if the vibrio on the following day proves to be cholera the contact with the carrier has been shortened and operates further to the advantage of those in detention, shortening their period of observation by about one day, and if it proves negative for cholera, no harm has been done.

In general, the practice may be summarized as follows:

Cabin passengers.—Cases of illness occurring among the cabin passengers are examined bacteriologically before release of cabin passengers. This practice was applied to all vessels from all European ports this season.

Where a vessel has had a case of cholera aboard, cabin passengers are held until it is determined that no ship infection is present, and that they have not been liable to infection, when they are released at once.

Crews.—Crews, excepting officers, on infected vessels are examined as a routine measure. Sick members of crews on uninfected vessels are always examined.

All steerage passengers are examined as a routine measure, as required under Department Circular No. 47, July 19, 1911 (vide supra).

In any case where a carrier is found a reexamination is made of all possible contacts which is initiated before the expiration of five days.

A very important matter in dealing with vessels is the determination of the amount of possible association of one class with another. A certain number of vessels carrying immigrants are built especially for the trade. It is a fairly safe procedure to recognize each class as a unit where infection has occurred among them. This has been recognized in the recent additions to the United States Quarantine Regulations. Thus, a case of cholera or a carrier found among the firemen or the sailors does not generally affect the steerage, or infection among the steerage does not affect the cabin.

It may be expected that carriers will be found on a vessel upon which a case of cholera has occurred, but it has also been demonstrated that carriers may be found on a vessel arriving with clean history and in good sanitary condition, as occurred on the *Duca di Genova.*

As stated hereinbefore, vessels carrying Italian immigrants are required, under the laws of Italy, to carry a medical officer of the Italian Navy, whose designation is that of Italian royal commissioner. He has no connection with the ship's crew or officers whatever. His mission is to look after the interests of the immigrants, and to that end he examines into the quantity, quality, and cooking of their food, which he tastes and examines before it is served. He looks after the comforts of the immigrants, cleanliness of their barracks, and the sick who require care and attention. In the event of any illness developing among any passengers or crew on board the vessel he is informed, and if it is, in his opinion, of an infectious nature, he carries out all preventative measures as to isolation and disinfection. During the present quarantine season the royal commissioner has, in cases where the diagnosis of cholera was made, or in cases of diarrhea. preserved specimens of the dejecta of such cases, also made cultures from the dejecta or vomit or both, by plating and on agar slants of Dieudonne's media, which he has submitted to the quarantine officer, together with a full history. In this way cases which have occurred at sea have been confirmed as cases of cholera. In this respect he is of the greatest assistance to the quarantine officer and if it is found that the measures adopted have been intelligently and effectively carried out, they should be given weight in the treatment of the vessel.

In addition, during the present quarantine season, an Italian royal commissioner, Dr. M. Serrati, attached to the Italian consulate at New York, has rendered most valuable assistance to the quarantine authorities in obtaining the active interest and cooperation of the officers in his corps and in many other respects in the handling of immigrants subject to examination, which greatly facilitated the work.

QUARANTINE AGAINST CHOLERA AT THE PORT OF BOSTON.

Ship.	Date of arrival.	Cholera on board.	Bacteriological examinations.	Cholera carriers found.	Cholera cases developed.
Cymric	July 27, 1911	0	139	0	0
Canopic	Aug. 9, 1911	0	1,180	0	0
Romanic	Sept. 7, 1911	0	315	0	0
Canopic	Sept. 25, 1911	0	417	0	0
Total		0	2,051	0	0

No bacteriological examinations were made prior to July 27, 1911. No cases of cholera or of cholera carriers are known to have occurred on ships arriving at Boston from July 1, 1910, to October 1, 1911.

One fatal case of cholera occurred in the city of Boston, July 20, 1911, in an Italian woman who was reported to have been a continuous resident of Boston for the past four years. The source of infection is unknown. (See Public Health Report. Vol. XXVI, No. 30, July 28, 1911.)

QUARANTINE AGAINST CHOLERA AT THE PORT OF PROVIDENCE.

Ship.	Date of arrival.	Cholera on board.	Bacteriological examinations.	Cholera carriers found.	Cholera cases developed.
Madonna	Aug. 3, 1911	0	472	0	0
Germania	Aug. 13, 1911	0	210	0	0
Roma	Sept. 9, 1911	0	329	0	0
Venezia	Sept. 25, 1911	0	408	0	0
Total		0	1,419	0	0

No bacteriological examinations were made prior to August 3, 1911. No cases of cholera or of cholera carriers are known to have occurred on ships arriving at Providence from July 1, 1910, to October 1, 1911.

SUPPLEMENTAL INSPECTIONS FOR THE DETECTION OF MILD OR PREVIOUSLY UNRECOGNIZED CASES OF CHOLERA MADE BY SERVICE OFFICERS WHILE EXAMINING ARRIVING ALIENS.

The medical officers of the service engaged in the inspection of arriving aliens were communicated with in regard to the invaluable aid which they might render by a careful endeavor on their part to detect cases of cholera which on account of obscure symptoms might have passed the regular quarantine inspection. As a result, the medical inspection of aliens can be rightfully classed as an important line of quarantine defense.

THE IMMIGRANT DESTINATION CERTIFICATION SYSTEM.

This was described in full in the last annual report of the service and has been in operation continuously since last summer. Many improvements in the operation of the system have been noted, especially in regard to the accuracy of the addresses given as to the destination of the immigrants, the return of the cards when found faulty, having had the result of insuring greater accuracy in the preparation of the emigrant manifests, from which the information transcribed upon the destination cards is obtained.

Instructions were issued July 20 by the Commissioner General of Immigration to commissioners at Boston, Ellis Island, N. Y., Philadelphia, Baltimore, and New Orleans, and the inspector in charge at Galveston, to have destination cards made out for all Italian arrivals whether coming from Italian ports or from other ports of Europe. The same instructions were made to apply to the subports of Portland, Me., and Providence, R. I.

Dissemination of Information Regarding Cholera to State and Local Health Authorities.

Information concerning the presence and spread of cholera in Europe and other data concerning the disease was distributed to State and local health authorities and to the general public through the medium of the weekly Public Health Reports, which contained the latest accurate information at hand.

Passed Asst. Surg. A. J. McLaughlin, whose recent service in the Philippines as assistant director of health had afforded him opportunities for a study of cholera at close range, was instructed to prepare for publication a manuscript containing such information as would enable health authorities and others not only to promptly detect the existence of the disease, but also to check its spread by the aid of efficient sanitary measures. His paper was published in the Public Health Reports of November 4, 1910, and constituted a succinct but complete monograph of the disease.

The chapter on the history of the disease summarized the reports of previous epidemics, and the data in regard to morphology and cultural reactions of the infectious agent were assembled in concise form under one heading. Separate chapters were devoted to the pathology, symptomatology, bacteriology, diagnosis, treatment, and prevention of cholera. In the part relative to prophylaxis, covering the last pages of the pamphlet, special attention was given to the rôle played by bacillus carriers in the spread of the disease. The fact was established that the spread of cholera is primarily due to one of these factors: (1) Bacillus carriers; (2) unrecognized light or atypical cases; (3) failure to find or report cases early; (4) carelessness in carrying out precautions or failure to take such precautions.

The precautions necessary to avoid the action of these factors were divided by the author into two groups, viz, (1) general preventive measures; (2) suppressive measures.

The first include those precautions which should be taken before cholera appears; the latter, the measures that are imperative after cholera has appeared.

All these measures were given at length and thoroughly discussed, to show their relative importance.

EXPERT AID IN THE DIAGNOSIS OF CHOLERA.

Notwithstanding the precautions outlined above, State and local health authorities were advised to exercise a surveillance over newly arrived Italian immigrants who have come within their State or local jurisdiction, for the detection and examination of cases simulating cholera.

In the event cases of gastro-enteritis or diarrhea among such immigrants give rise to suspicion, the local health officer was advised to notify his State board of health and the Surgeon General of the Public Health and Marine-Hospital Service, and if such action was deemed advisable an expert would be sent by the Public Health and Marine-Hospital Service, either for determination as to the diagnosis or assistance in the matter of preventive measures, or both.

The service has stationed experts, who are available for duty within a practical radius of their stations, at the following-named ports: New York; Boston; Washington, D. C.; Chicago; San Francisco; New Orleans; and Savannah, Ga.

AN INTERPRETATION OF ARTICLE 9 OF THE INTERNATIONAL SANITARY CONVENTION AT PARIS, 1903, AS RELATING TO NOTATIONS ON BILLS OF HEALTH.

On October 9, 1910, the Italian ambassador to the United States informed the Department of State that the United States consul at Palermo had violated article 9 of the Convention of Paris, in noting upon bills of health issued to departing vessels the occurrence of cases of cholera at Palermo within the two weeks prior to the issue of the bill of health. The fact that nine days had elapsed since the last imported case of cholera was considered by the royal Italian ministry of foreign affairs to have been in violation of article 9 above mentioned, which is quoted as follows:

> ARTICLE 9. In order that an area may be considered as being not under contamination it must be officially ascertained, first, that there has been neither a

case nor a death of plague or cholera within five days after the isolation, death, or cure of the last plague or cholera patient; second, that all the measures of disinfection have been applied, and in the case of plague that the measures against rats have been executed.

This question was referred to the Treasury Department by the Department of State in a letter dated October 24, and the following extracts are given from a letter dated November 4, 1910, addressed to the honorable, the Secretary of State, from the Secretary of the Treasury, which extracts define the purpose of a consular bill of health, and also show that in the treaty of Paris, except in paragraph 3, chapter 2, article 110, all relating to provisions regarding pilgrimages, which do not apply in any respect to the matter in hand, there is no mention made of bills of health:

> The statement of the Italian ambassador is to the effect that the action of the American consul at Palermo in making note of cases of cholera occurring during the last two weeks upon the bills of health of departing vessels is in violation of article 9 of the Convention of Paris, and that the consuls of other nations deliver bills of health completely clean, and the Italian ambassador begs the Department of State to have telegraphic instructions imparted to the consul in Palermo to abstain from making any notes which may damage the interests of Palermo, nine days having elapsed since the last cholera case having been reported to the American consul in Rome.
>
> Regarding this presentation I have to invite your attention to the treaty of Paris referred to and to article 9 quoted by the ambassador. This article declares (1) in order that an area may be considered as being not under contamination it must be ascertained that there is neither a death nor a case of cholera within five days after the isolation, death, or cure of the last plague or cholera patient.

There is nothing in this to prevent the United States consul from stating the facts in his bills of health. He makes no declaration that the area is contaminated; the facts as he states them will show the authorities in the United States whether an area is contaminated or not within the meaning of article 9, but whether the area is contaminated or not the information is necessary. To the statements of the ambassador that the consuls of other nations deliver bills of health absolutely clean may be replied that whatever the nature of the United States bill of health, it is a communication conveying information which, it is believed, any consul has a right to convey to his own country. It should be borne in mind that in the United States laws and regulations there are no such terms as "clean bill of health" or "foul bill of health." Formerly, and possibly at the present time, these terms were in use in some countries, with a distinct meaning attached to them, but they have never been used in laws and regulations by the United States Government. Furthermore, the treaty of Paris makes no mention of a bill of health at all, except in paragraph 3, chapter 2, article 110, all relating to provisions regarding pilgrimages which do not apply in any respect to the matter just discussed.

Rat Quarantine.

DESTRUCTION OF RATS ON VESSELS.

The project for creating a universal sentiment in favor of the destruction of rats on vessels, which has been discussed in the annual reports of the service for 1908, 1909, and 1910, has been subject to such organization during the past fiscal year that the quarantine officers and the shipping interests are coordinating their efforts with satisfactory results. The basis on which this work is being carried on is paragraph 112 (p. 39) of the Quarantine Laws and Regulations, 1910. This paragraph provides that such measures shall be taken as will free from rats, not less than every six months, vessels engaged in trade from ports infected with plague.

The first step in the organization of this work was to require all of the quarantine officers to submit a list of vessels plying between United States ports and foreign ports infected with plague. In addition to this, data was obtained as to the kind of cargo brought by the vessels, particularly with reference to whether said cargo comprised the various foodstuffs, such as rice, bran, cereals, etc. Each quarantine officer was then directed to communicate with the agents of the various lines interested and arrange for the fumigation of these vessels twice a year, at a point most convenient for the vessel, and preferably where the latter would be empty. It was explained that should it be found advisable to fumigate a vessel at a foreign port there must be ample assurance that the fumigation performed would be effective. In those ports infected with plague wherein medical officers of the service are stationed in the offices of the Americon consuls there is no apprehension that the work of fumigation will not be properly performed. In the case of many other foreign ports wherein plague is either present or suspected of being present and where there are not the proper facilities for performing this fumigation it is directed that vessels be fumigated at the quarantine station at the United States port of arrival. The quarantine officers were not only directed to carry out this work systematically for the purpose of preserving the proper records under the heading "Rat quarantine," but they were directed to report the names of the vessels fumigated, the date of arrival, date of fumigation, number of rats destroyed, and the fact, if such were found to be the case, that all of the rats on board were not destroyed.

TRANSACTIONS AT SAN FRANCISCO QUARANTINE.

During the week ending May 27, 1911, the following special memoranda appear in regard to vessels being fumigated for the destruction of rats:

British steamer *Marti:* Last fumigated at Melbourne, Australia, October 14, 1910; rat yield, 17. Fumigated May 26, resulting in a rat yield of 37. This was a very old steamer, and the rats undoubtedly had means of traveling all over the vessel. The cold-storage plant was found to be located just aft of the No. 4 hold, and after the fumigation dead rats could be seen in the back part of the space between the cold-storage plant and the bulkhead. It was believed on this account that all the rats were not destroyed by this fumigation, for it was very likely that with such spaces in the hold of the vessel it would be impossible to kill all of the rats.

This is mentioned as a suggestion to shipowners to "build out" spaces such as the above in order that the rats can not seek refuge in them and thus escape the destruction which is considered so necesary to the prevention of plague.

British steamer *Boveric:* Fumigated at Sydney, Australia, on March 11; rat yield, negative. On arrivel fumigated June 7, with rat yield of 14.

British steamer *Epsom:* Fumigated on May 26, after a previous fumigation performed at Bombay, at Kobe, and again at Manila, on the same voyage; rat yield, 24. The explanation of the presence of so many rats on this vessel after three fumigations was the fact that the storerooms had never been fumigated at any of the ports mentioned.

Norwegian steamer *Thyra:* Vessel fumigated one year previous to fumigation performed June 21; rat yield, 27.

Additional vessels fumigated at San Francisco, Cal.

Steamship.	Place.	Date.	Number of rats.	Remarks.
Vessels plying to Hawaiian Islands.				
Enterprise	Hilo	Apr. 9, 1910	13	
	....do	July 21, 1910	110	
	San Francisco	Sept. 30, 1910	120	
	Hilo	Jan. 14, 1911	8	
Hilonian	San Francisco	Sept. 9, 1910	150	
	....do	Nov. 4, 1910	12	
	....do	Mar. 29, 1911	0	
Honolulan	....do	Apr. 24, 1911	10	A new steamer built this year.
Hyades	....do	Sept. 18, 1910	75	
	....do	Jan. 26, 1911	10	
Lurline	....do	Nov. 25, 1910	54	
	....do	Apr. 6, 1911	5	
Sierra	....do	Nov. 30, 1910	38	
	....do	Mar. 15, 1911	50	Mice.
Wilhelmina	....do	Dec. 15, 1910	30	
			120	Do.
Trans-Pacific liners.				
America Maru	Yokohama	Dec. 23, 1910	0	Vessel laid up for one year previous to Dec. 1, 1910.
	San Francisco	Mar. 19, 1911	12	
	Hongkong	Apr. 27, 1911	0	
British.				
Asia	Hongkong	Jan. 15, 1910	4	
	....do	Nov. 19, 1910	4	
	San Francisco	Dec. 29, 1910	0	
	....do	Mar. 9, 1911	0	
China	Hongkong	Aug. 9, 1910	....	Result not known.
	San Francisco	Sept. 13, 1910	130	Forty rats trapped by the crew during year.
	....do	Feb. 16, 1911	60	
Chiyo Maru	Hongkong	June 4, 1910	....	Result not known.
	San Francisco	Sept. 30, 1910	170	Thirty rats were trapped by the crew during the year.
	Hongkong	Nov. 12, 1910	40	
	San Francisco	Mar. 2, 1911	168	
	Hongkong	Apr. 11, 1911	5	
Korea	San Francisco	May 27, 1910	30	No history of the fumigation of this vessel during the year at Hongkong.
	....do	Jan. 20, 1911	60	
Manchuria	Hongkong	Aug. 17, 1910	0	
	San Francisco	Dec. 8, 1910	80	Mice.
Mongolia	Hongkong	Dec. 31, 1910	....	Result not known.
	San Francisco	Mar. 15, 1911	500	Mice.
Nippon Maru	Hongkong	July 20, 1910	....	Result not known.
	....do	Dec. 26, 1910	26	
	....do	May 29, 1911	152	
Persia	....do	Jan. 24, 1911	17	Vessel previous to Jan. 1, 1911, in trade between Hongkong and Manzanillo.
Siberia	San Francisco	Sept. 8, 1910	290	
	Hongkong	Oct. 13, 1910	40	
	San Francisco	Feb. 8, 1911	75	
Tenyo Maru	Hongkong	Sept. 17, 1910	46	356 rats trapped by the crew during the year.
	San Francisco	Oct. 27, 1910	130	
	....do	Mar. 29, 1911	45	
	Hongkong	May 8, 1911	8	

The quarantine officer at San Francisco received a letter on October 10 from the master of the schooner *Joseph Russ*, in which it was stated that so far 176 dead rats had been found in the vessel, as the result of the fumigation made at San Francisco quarantine during the last week of September. Inasmuch as the schooner *Russ* is only 235 tons gross, it is believed that the percentage of rats to the tonnage of the vessel is in excess of all previous records.

COLUMBIA RIVER QUARANTINE STATION.

The medical officer in command reports that the large majority of shipmasters, despite the inconvenience, express general satisfaction with a periodical fumigation for rat destruction.

The Oregon State Board of Health is supplementing the work of the medical officer in command, by enforcing the recommendations they invited him to formulate, governing vessels after entering the various rivers of the State.

On September 23, 1910, bark *Denmark* from Honolulu arrived in port and reported having been fumigated at Honolulu.

November 29, 1910, the schooner *Wm. Nottingham* from Callao arrived, having been fumigated at the port of departure.

The following vessels were fumigated after arrival at the Columbia River quarantine station:

February 15, 1911, ship *Klio* from Talcahuano, 22 rats found. March 25, 1911, the bark *Ocean* from Salaverry, Peru, 27 rats found. April 24, 1911, steamship *Henrik Ibsen* from Hongkong, 18 rats found. May 5, 1911, steamship *Hercules* from Hongkong, 80 rats found.

NEW ORLEANS QUARANTINE.

On April 15 a special officer was designated to inspect all vessels arriving at New Orleans from ports suspected of infection or actually infected with plague, in order to ascertain, during the discharge of such vessels, the number of rats found, and thereby determine the value of fumigation done at outlying stations, such as Castries, St. Lucia, and Bridgetown, Barbadoes.

All the vessels so inspected are subject to rather frequent fumigations, which owners desire rather than evade, because of damage by rats to cargo, and the appended table shows a gratifyingly small number of rodents.

It is to be noted, however, that occasionally fumigations have not been efficient, as evidenced in the finding by the inspector of a nest of very young rats on the steamship *Pruth*, fumigated at St. Lucia and at New Orleans quarantine, which demonstrates the necessity for extreme care in fumigating cargo ships, to avoid giving a false sense of security.

On the whole, the results have been good, and it is apparent that rats learn that certain ships are subject to frequent fumigation, and avoid such ships.

Acting Asst. Surg. Lamb, the officer doing this work, reports that the Brazilian rat on coffee ships is a blacker and smaller animal than the local *M. Norvegicus*, and probably is *M. Alexandrinus*, which enables him to avoid, at least to some extent, false conclusions as to rats aboard.

Transactions.

Name of vessel.	Previous fumigation.		Arrived at this port.	Live rats found.	Dead rats found.
	Place.	Date.			
Steamship Thordisa	St. Lucia	Mar. 22	Apr. 15	0	12
Steamship Milton	do	Apr. 4	do	5	1
Steamship Atbara	do	Apr. 19	Apr. 30	0	3
Steamship Coronation	Barbadoes	Apr. 18	May 1	0	2
Steamship Black Prince			May 7	0	0
Steamship Devonshire	Barbadoes	Apr. 29	May 9	0	0
Steamship Kathleen	St. Lucia	May 3	May 15	0	0
Barkentine Rachel Emery			May 16	0	1
Steamship Pruth	St. Lucia	May 26	June 5	5	0
Steamship Chaucer	do	June 5	June 13	0	6
Steamship Strombus			June 16	0	0
Steamship Yucatan			June 20	0	14
Steamship Spanish Prince	Port of Spain	June 12	June 22	0	5

NOTE.—All these vessels were fumigated at New Orleans quarantine.

TAMPA BAY QUARANTINE.

Transactions.

[No cargo and no evidence of rats alive after fumigation.]

Date of month.	Name of vessel.	Port of departure.	Number of rats found killed.
1910.			
July 21	Steamship Almerian	La Guaira	13
July 22	Steamship Ormistra	Rio de Janeiro	2
July 30	Steamship Netherpork	do	24
Aug. 12	Steamship Madura	do	35
Aug. 22	Steamship Glenarm Head	do	8
Sept. 4	Steamship Mar Cantabrico	Pernambuco	3
Sept. 15	Steamship Stathavon	Rio de Janeiro	12
Oct. 2	Steamship Torr Head	do	4
Oct. 11	Steamship Euston	do	18
Oct. 12	Steamship Ramsay	do	7
Oct. 20	Steamship Mar Adriatico	Pernambuco	11
Nov. 7	Steamship Puritan	Santos	50
Nov. 29	Steamship Baron Cawdor	Rio de Janeiro	75
Dec. 16	Steamship King Edgar [1]	do	50
Dec. 19	Steamship Baron Ogilvy	do	
1911.			
Jan. 10	Steamship Baron Napier	do	
Jan. 16	Steamship Radiance	do	7
Feb. 2	Steamship Cara	do	
Feb. 2	Steamship Glenshiel	do	
Feb. 16	Steamship Royal Crown	do	6
Feb. 18	Schooner Margaret Thomas	do	14
Feb. 28	Steamship Cluden	Pernambuco	12
Mar. 10	Steamship Mrytledene	do	16
Mar. 13	Steamship Teviotdale	Rio de Janeiro	
Apr. 9	Steamship Tapton	Bahia	18
Apr. 11	Steamship Holland	Para	1
Apr. 15	Steamship Louisianian	La Guaira	30
Apr. 16	Steamship Nith	Bahia	8
Apr. 22	Steamship Tweeddale	Rio de Janeiro	40
Apr. 23	Steamship Tynedale	do	9
Apr. 25	Steamship Albanian	La Guaira	12
Apr. 28	Steamship Dunclutha	Rio de Janeiro	
Apr. 28	Steamship Arreaz	Para	8
May 2	Steamship Ikbal	Rio de Janeiro	
June 1	Steamship Royal Sceptre	do	19
June 4	Steamship Comedian	La Guaria	
June 9	Steamship Valle	Pernambuco	8
June 21	Steamship Inkum	Rio de Janeiro	8
June 22	Steamship Inkula	do	
June 23	Steamship Jevington	do	6
	Total		534

[1] Six rats were killed by fumigation on the lifeboats of the *King Edgar*.

MANILA, P. I., AND SUBSTATIONS.

For a number of years it has been the policy of the United States Public Health and Marine-Hospital Service in the Philippine Islands to require a semiannual fumigation of all vessels touching at local ports of entry. As the records of these fumigations have been kept more accurately and comprehensively the work has correspondingly increased in volume and frequency.

The vessels subjected to fumigation in the Philippines may be divided into two classes, namely:

1. Those from foreign ports.
2. Those engaged in interisland commerce.

While it is not practicable to conduct the fumigations of all vessels coming to the islands, nevertheless an effort is made to secure a sanitary history of every vessel. In the instances of vessels fumigated elsewhere, this information is gleaned from bills of health, certificates, and other sources.

For the purpose of keeping records of fumigation, vessels from foreign ports are classified as follows:

1. Vessels bringing rice from plague-infected ports.
2. Vessels from foreign ports intending to load Philippine cargo for ports in the United States.
3. Vessels making the Philippines a terminus.
4. Vessels making the Philippines a port of call.
5. Vessels bringing general cargo from plague-infected ports.

The arrangements for the fumigation of these vessels are usually made by the quarantine boarding officer upon the vessel's arrival or when the "certificate of arrival" is presented at the quarantine office.

Vessels bringing rice from Saigon, Rangoon, and other plague-infected ports, are required to be thoroughly fumigated each time after the cargo has been discharged. A vessel carrying rice appears to have an especial attraction to rats as an abode; and for that reason a persistent campaign of fumigation has been waged. It frequently happens that vessels engaged in this trade are fumigated five or six times annually, and invariably with good results. When rice-carrying vessels decline fumigation on the grounds that they will not return to the archipelago, the responsible persons are informed that a certificate of fumigation from a reliable official will be demanded before the vessel will again be admitted to free pratique at a Philippine port of entry.

Before vessels load cargo for ports in the United States they are subjected to careful fumigation, inasmuch as they have usually called at infected ports in Japan and China prior to their arrival in the islands.

Since the inauguration of a world-wide campaign of extermination, it is noticeable that freighters engaged in intercontinental trade are becoming remarkably free from rodents. In this connection may be mentioned the experience in Manila when, after fumigating four of the largest cargo-carrying vessels, *Lennox*, *Sandon Hall*, *Epsom*, *Hallamshire*, a net yield of 1 rat was recorded. It is probable that more rats were killed and were not promptly located, but the fact remains that reliable officials made many careful searches, and as a result gave the opinion that the rat population is being kept down.

A number of vessels that make the Philippines a terminus are fumigated periodically at Manila, Cebu, or Iloilo. It was a matter of common knowledge that these vessels suffered heavily through the damage wrought by the rodents upon hawsers, awnings, ship's stores, and cargo before regular fumigation was begun. Now it is rare to hear of damage to the cargo or supplies, and where as many as 250 rats were formerly destroyed by a single fumigation, there are now not more than 70 and usually only an average of 40 rats in a large vessel.

It is, of course, highly desirable that a vessel be empty when the fumigation is performed, but many of the foreign vessels calling at Manila constantly carry cargo for other ports, so that fumigation must necessarily be deferred. To the end that it may be learned when and where such fumigations have been done, the American consuls at the several foreign ports have been requested to enter the facts upon the bills of health.

At the present time a number of vessels are receiving a partial fumigation in Manila and are having the process completed in Hongkong, because they always carry transit cargo at both ports, and do not become entirely empty until they reach the ports on the west coast of the United States.

It is deemed unwise to permit vessels constantly and frequently plying between plague-infected ports and the Philippine Islands to remain without fumigation for a period of six months, even though they may have taken every precaution to prevent the shipping of rodents. To this end, such vessels are more frequently treated, thus affording better protection against the possible introduction of rodent plague. Inasmuch as the archipelago is literally surrounded by plague-infected ports, there are practically no vessels arriving in the Philippines that have not touched at one or more infected points; thus the importance of frequent and complete fumigation becomes evident.

Insular vessels that have visited Chinese ports for the purpose of dry docking or receiving repairs are fumigated by a service representative before being permitted to return to the islands.

It is believed that much good has been accomplished by the semiannual fumigation of vessels engaged in interisland trade. The work has been carried on without complaint and with many expressions of appreciation from ships' officers, owners, agents, and the general traveling public. Besides ridding the vessels of rats, the process has exterminated myriads of cockroaches, ants, centipedes, spiders, and other pests.

Occasionally it happens that efforts are made to avoid or postpone fumigation. The master of one of the Coast and Geodetic Survey vessels in Philippine waters objected to the process because of the supposed corrosive action on the steel plates of his command. Inasmuch as thousands of fumigations had previously been performed without appreciable corrosive action upon steel vessels, fumigation was insisted upon in this instance, and was accompanied, it might be mentioned, by no damage.

Valid pleas are always given careful attention. It often happens that the prompt removal of a cargo from a neighboring port is demanded by unfavorable weather conditions or by the terms of a charter. In these instances, provided that there is evidence of an actual exigency, the fumigation is postponed for a short time.

Interisland vessels and vessels from foreign ports, which have undergone quarantine inspection at a prior Philippine port of entry, are ordinarily permitted to enter the other ports without flying the quarantine flag or awaiting quarantine inspection. They are required, however, to file a "certificate of arrival" (Form No. 1) at the quarantine office within one hour after dropping anchor in the river or bay. When this certificate is presented at the quarantine office, a clerk scans the list of vessels posted for fumigation. This list is kept up to date by preparing it weekly. If the vessel's name appears upon the list, the person presenting the certificate is given a dated fumigation notice.

It is rarely necessary to instruct the officers of local vessels in the preparation of the different compartments for the reception of the sulphur dioxide. From past experiences they know the value of protecting metallic surfaces with tallow and removing perishable food and fabrics from the action of the gas. The work is greatly facilitated by requesting that the air ports be made tight, the hatches and tarpaulins properly placed, and ventilators covered before the arrival of the fumigating party.

In Manila the pot-and-pan method of burning sulphur is used and has proven both efficient and expeditious, especially on the smaller craft. Because of the greater leakage of gas and the greater dependence placed upon fewer pots, larger quantities of sulphur are proportionately used in small vessels than in the larger ones.

Constant efforts are made to popularize fumigation by causing the minimum amount of delay and inconvenience to the persons intimately concerned. Except in an emergency, the fumigation is begun late in the afternoon and continued through the night. The hatches are removed in ample time in the morning to permit the gas to escape prior to beginning work for the day.

When a vessel departs for a foreign port immediately upon the completion of the fumigation and before an opportunity for ascertaining the result of the process is afforded, the master is supplied with an addressed envelope and instructed to stamp and mail the accomplished form from the next port.

Since fumigation has become a firmly established procedure it has been noticeable that very few cases of smallpox have occurred aboard the vessels.

A report of the results of fumigation are required from every vessel so treated and is obtained through the use of a blank form, which must be filled out and signed by the master. The reports rendered are both interesting and instructive. The number of rats usually destroyed by fumigation on the different vessels in the Philippine Islands vary as follows: Launches, from 5 to 20 rats; schooners, from 4 to 12 rats; lighters, from 1 to 3 rats; small steamers, from 5 to 30 rats; large steamers, from 15 to 80 rats; ocean freighters, from 30 to 250 rats.

It is interesting to note that vessels carrying firewood and lumber are particularly prone to harbor rats. Cockroaches are usually killed by the bucketful. Centipedes, scorpions, and other insects are occasionally reported.

When the report of fumigation is received it is entered upon a card, a part of a card-index system. Besides the vessel's name and rig, there are spaces on the card for the tonnage, number of holds, the number of pots of sulphur used, a column for remarks, and sufficient space for recording the results of four and one-half years of semiannual fumigations.

On the reverse side of the card is placed all information concerning the location, individual sizes, and communications of the several compartments of the vessel. After this information has once been obtained and properly tabulated, the future treatment of the vessel can be planned at a glance. The cards are arranged by months. When a vessel has been fumigated the card bearing her name is placed under an appropriate heading six months behind the others. Thus, as the vessel again becomes due for fumigation, the card gradually works forward and at the proper time serves as a reminder. In order that the card-index system may not become unwieldy, the vessels are classed under three heads, "foreign," "insular," and "Government."

For facilitating the actual work, obtaining the results and keeping an accurate record of the work of fumigation, this system has proved of inestimable value in the Philippine Islands.

It is felt that the freedom of the Philippine Islands from plague is due in no small measure to this useful method of keeping fumigation records.

REPORTS FROM THE NATIONAL QUARANTINE STATIONS.

During the fiscal year ended June 30, 1911, at the various stations in the United States, a total of 8,334 vessels were inspected, including 420 disinfected, either for the destruction of mosquitoes as a precaution against the introduction of yellow fever, or for the destruction of rats and other vermin as a precaution against plague. In addition 1,026 vessels were spoken and passed, making a grand total of 9,360 vessels and 519,495 passengers and crews passing under the observation of the service at ports in the Continental United States.

Following are the summaries of the operations at the various quarantine stations:

Alexandria (Va.) quarantine.—Acting Asst. Surg. Arthur Snowden in charge. Six vessels, carrying 79 members of crew, were inspected and passed.

At Alexandria, Va., the quarantine inspection is also made of vessels destined to Washington, D. C.

Eastport (Me.) quarantine.—Acting Asst. Surg. E. M. Small in charge.

Eight hundred and forty-three steamers and 55 sailing vessels were inspected. These vessels carried a total of 33,114 passengers and 23,790 crew.

Portland (Me.) quarantine.—Surg. J. M. Eager in command.

One hundred and thirty steamers and 62 sailing vessels were inspected and passed. These vessels carried 7,717 crew and 7,844 passengers.

Perth Amboy (N. J.) quarantine.—Acting Asst. Surg. Charles W. Naulty, jr., in charge.

Ten steamers were spoken and passed; 71 steamers and 4 sailing vessels were inspected and passed and 4 vessels were fumigated. There were 1,807 passengers and crew.

Under the authority of department approval of May 5, 1911, a quarantine anchorage was located at Perth Amboy, and the marking of the anchorage by suitable buoys is now in progress.

The approximate position of the buoys is as follows, all the bearings being magnetic:

Quarantine Buoy No. 1.

Great Beds Lighthouse, south by east.
Ploughshare Point (tangent), NNE. ¾ E.
Ward Point (tangent), SE. ¾ S.

Quarantine Buoy No. 2.

Great Beds Lighthouse, S. by E. ¼ E.
Ploughshare Point (tangent), NNE. ½ E.
Ward Point (tangent), SE. ¾ E.

Delaware Breakwater quarantine.—Post office and telegraphic address, Lewes, Del., Acting Asst. Surg. George G. Hart in charge:

Twenty-six steamers and 16 sailing vessels were inspected and passed. One steamer was fumigated.

On account of a case of smallpox having occurred on board, the *Italian* steamship *Verona* was remanded to this station from Philadelphia, Pa., with 156 crew and 790 (43 second cabin, 747 steerage) passengers, and arrived April 6, 1911. Passengers and their effects were landed, the vessel disinfected and released with most of the crew and 281 passengers. These passengers had been successfully vaccinated previously and had their baggage and clothing disinfected here. The remaining persons were detained until April 16, and then released, no new cases having appeared. The baggage and clothing of all were disinfected.

Cape Charles quarantine.—Passed Asst. Surg. Hugh S. Cumming in command.

	Steam.	Sailing.	Total.
Inspected	[1] 487	13	500
Inspected and passed	477	13	490
Detained for fumigation	8	0	8
Held five days after	2	0	2
Held for further diagnosis of case	2	0	2
From infected ports via northern ports	153	0	153
From infected ports not detained because of previous fumigation at ports of departure or call, certified by competent authority	36	0	36
Crews upon arriving vessels			41,776
Passengers upon arriving vessels			1,534

[1] Includes 23 vessels of United States Navy and their personnel.

Two patients were removed to the station pending sailing of the vessels, of whom one had leprosy and one a severe case of amoebic dysentery and remittent malaria.

Reedy Island quarantine.—Post-office address, Port Penn, Del.; telegraphic address, Reedy Island, Del. Passed Asst. Surg. Charles W. Vogel in command.

During the year 1,233 vessels were inspected and passed, of which 1,141 were steamers and 92 sailing vessels; 95,088 persons were inspected, of which 43,870 were crews of steamers, 999 crews of sailing vessels, 50,219 passengers on steamers and 4 passengers on sailing vessels; 16 vessels were spoken and passed. Glandular examinations were made of the crews of 15 vessels.

On October 25, 1910, the steamship *Taormina*, from Genoa, via New York, arrived, and on account of a death of a passenger from suspected cholera during the voyage was detained at this station six hours and then released by order of the bureau. The vessel, crew, and passengers were disinfected at New York.

On April 2, 1911, the steamship *Verona*, from Naples, via New York, arrived, and on account of a case of smallpox removed from the vessel at New York all of the crew and passengers not showing recent successful vaccination were vaccinated and the vessel released.

On April 10, 1911, the steamship *Merion*, from Liverpool, arrived. One smallpox suspect was removed for observation. A diagnosis of measles was made later in this case.

On May 2, 1911, the steamship *Haverford*, from Liverpool, arrived. One case of smallpox and 183 contacts were removed. The entire personnel of the ship was vaccinated, one steerage compartment and the ship's hospital were fumigated, and the vessel released.

On May 29, 1911, the steamship *Rhein*, from Bremen, arrived. One case of chickenpox was removed for observation and the vessel released.

On June 5, 1911, the steamship *Haverford*, from Liverpool, arrived. One case of chickenpox was removed for observation and the vessel released.

Washington (N. C.) quarantine.—Acting Asst. Surg. J. C. Rodman in charge. There were no transactions during the year.

Cape Fear quarantine.—Post-office and telegraphic address, Southport, N. C.; Asst. Surg. William M. Bryan in command.

Sixty-nine vessels arrived at the Cape Fear quarantine during the year from the following places: Domestic ports, 19; West Indies, 7; Cuba, 1; South America, 8; Europe, 33; and Africa, 1.

Thirteen vessels were fumigated, 3 of which were retained for inspection and observation. Eight vessels were large steamships from South American ports with cargoes of nitrates. One fumigation was for the destruction of mosquitoes on a vessel from a yellow-fever infected port; 2 were from domestic ports. The crews of these two vessels had smallpox and 6 men were detained in the quarantine hospital until their recovery. Two large seagoing dredges were fumigated for the destruction of rats and vermin upon the request of the United States engineer office at Wilmington, in charge of the river and harbor work at that port.

In accordance with bureau instructions and paragraph 112 of the Quarantine Laws and Regulations, 2 steamships were fumigated by the station force and equipment at Wilmington, N. C., this for the destruction of the rats on board after the cargoes had been discharged. These were "nitrate" vessels from South American ports with cargoes of nitrates in bags. To avoid the destruction of the bags by the action of sulphur, the unloading was done under the supervision of a representative of the service at Wilmington, and wherever evidence of rats was found the vessel was fumigated before allowed to clear for another port.

Georgetown (*S. C.*) *quarantine.*—Acting Asst. Surg. M. P. Moorer in charge: Four sailing vessels were inspected. These vessels carried 30 passengers and crew.

Charleston (*S. C.*) *quarantine.*—Passed Asst. Surg. R. L. Wilson in command: One hundred and thirty-four steamers and 6 sailing vessels were inspected and passed. The vessels inspected carried a total of 50 passengers and 5,308 crew.

Beaufort (*S. C.*) *quarantine.*—Acting Asst. Surg. Christopher G. Hay in charge: Two steamers and 3 sailing vessels were inspected and passed.

Port Royal (*S. C.*) *quarantine.*—Acting Asst. Surg. William P. Gibbes in charge: No vessels were inspected during the year.

Savannah (*Ga.*) *quarantine.*—Asst. Surg. C. M. Fauntleroy in command: One hundred and fifty-six steamers and 4 sailing vessels were inspected and passed, and 1 steamer was inspected and detained. Ninety-one vessels were spoken and passed. The vessels inspected carried 4,948 crew and 78 passengers.

South Atlantic quarantine.—The station now in the custody of two quarantine attendants, all public property being stored and kept in readiness for immediate use in the event the station is required for refuge purposes during a quarantine emergency.

Brunswick (*Ga.*) *quarantine.*—Acting Asst. Surg. J. A. Moncure in charge: Thirty-four vessels were spoken and passed; 20 steamers and 23 sailing vessels inspected and passed. Four hundred and ninety-one crew on steamers, 198 crew on sailing vessels, 15 passengers on steamers, and 9 passengers on sailing vessels were inspected.

No quarantinable diseases were encountered during the year.

Tampa Bay (*Fla.*) *quarantine.*—Post-office address, Fort De Soto, Fla. Telegraphic address, via Palmetto, Fla. Passed Asst. Surg. H. McG. Robertson in command.

Four vessels were spoken and passed, 95 steamers and 124 sailing vessels were inspected and passed, and 43 steamers and 1 sailing vessel were disinfected. These vessels carried a total of 86 passengers and 5,507 crew.

The number of vessels arriving at Tampa Bay quarantine station during the fiscal year ending June 30, 1911, was larger than for any other year since the station was established.

The total number of vessels for the year was 267, being 15 more than for the year ending June 30, 1908.

No quarantinable disease was found on any of the vessels arriving during the year, but 21 seamen were taken ashore either for observation or because it is customary to keep at the quarantine station all persons who show, on examination, a rise of temperature.

Seven of the seamen were taken off the steamer *Cara*, on which a case of smallpox had developed while the vessel was en route from Rio de Janeiro to Bridgetown, Barbados, but no further cases developed.

Two seamen were taken from schooners from Guanica, Porto Rico. These were found to have enteric fever.

The others, 12 in number, came from various tropical ports and were suffering from malarial fever.

Thirty-nine steamers and 1 schooner were fumigated for the destruction of rats, and during the year about 534 were found killed. In one instance the lifeboats on a steamer were closely covered with canvas and fumigated. In those boats 6 rats were found dead at the close of the fumigation.

Twenty-six steamers were fumigated for both rats and mosquitoes, and 1 for the destruction of rats and on account of having had a case of smallpox aboard.

Cumberland Sound quarantine.—Post-office and telegraphic address, Fernandina, Fla. Acting Asst. Surg. J. Louis Horsey in charge.

Eighty-two vessels were spoken and passed, 109 steamers were inspected and passed, and 1 sailing vessel was disinfected; 28 sailing vessels were inspected and passed. On these vessels there were 4,007 crew and 16 passengers.

St. Johns River quarantine.—Post-office and telegraphic address, Mayport, Fla. Acting Asst. Surg. Neil Alford in charge.

Eighty-one vessels, carrying 1,308 passengers and crew, were inspected, and 252 vessels were spoken and passed.

Biscayne Bay quarantine.—Post-office and telegraphic address, Miami, Fla. Acting Asst. Surg. James M. Jackson, jr., in charge.

Three hundred and three vessels were spoken and passed; 34 steamers and 115 sailing vessels were inspected and passed. These vessels carried a total of 7,439 passengers and crew.

Key West (Fla.) quarantine.—Acting Asst. Surg. S. D. W. Light in charge.

During the year 259 steamers, carrying crews aggregating 14,197 and 14,859 passengers, and 70 sailing vessels, carrying crews of 558 and 155 passengers, respectively, arrived at the station.

Two sailing vessels have been disinfected and detained in quarantine, and the U. S. S. *Marietta* arrived at this station February 5, 1911, from Puerto Cortez, Mexico, with 6 cases of supposed yellow fever, which were diagnosed as pernicious malarial fever.

Two cases of quarantinable diseases (smallpox) came under the station's jurisdiction, taken from the American schooner *Horatio G. Foss*, five days out from Mobile, Ala., and bound for San Juan, P. R. The infected schooner arrived at the station May 9, 1911, with a member of the crew in the papular stage of smallpox.

The entire personnel was at once vaccinated and the sick man isolated until he was taken ashore on the 12th instant, and treated in tents, pitched on the Government reservation, and the forecastle thoroughly disinfected with sulphur.

A second case of the disease in a mild form developed seven days later, and patient was isolated with prior one, and living quarters were redisinfected, and the vessel left for her destination the following day, with no additional cases developing by the time she had reached her destination. Both cases made a good recovery.

Knights Key (Fla.) quarantine.—Acting Asst. Surg. Yates Porter in charge.

During the fiscal year 77 vessels, carrying 10,698 passengers and crew, were inspected and passed. The services of this officer were discontinued in May, 1911, and the station will be closed until the resumption of traffic in the early winter.

Boca Grande quarantine.—Post-office and telegraphic address, South Boca Grande, Fla. Acting Asst. Surg. W. Barnes in charge.

Transactions at the Boca Grande Quarantine Station for the fiscal year ending June 30, 1911.

	Steamships.	Sailing vessels.	Total.
Inspected and passed from foreign ports	4	1	5
Vessels spoken and passed	13	2	15
Number of crew inspected	91	8	99
Total number of vessels entering port	17	8	20

No quarantinable disease was encountered, and no vessels were fumigated or detained.

Pensacola (Fla.) quarantine.—Acting Asst. Surg. R. C. White in charge.

During the year 19 vessels were boarded and passed, 24 vessels were spoken and passed, 118 steamers were inspected and passed, and 20 steamers were disinfected; 75 sailing vessels were inspected and passed and 14 sailing vessels were disinfected. On these vessels there were 6,735 crew and 25 passengers, and while no cases of quarantinable disease occurred, 1 case of malarial fever, remittent, was removed to the hospital at the station for observation and treatment.

St. George Sound quarantine.—Post office and telegraphic address, Carrabelle, Fla. Acting Asst. Surg. B. B. Blount in charge.

Forty-nine vessels carrying crew aggregating 382 persons were inspected and passed.

Port Inglis (Fla.) quarantine.—Acting Asst. Surg. B. W. Burland in charge.

During the year 16 steamers and 8 sailing vessels were spoken and passed; 13 steamers were inspected and passed; and 3 steamers were inspected, fumigated, and passed. The 16 steamers inspected carried 5 passengers and 503 crew.

Mobile (Ala.) quarantine.—Passed Asst. Surg. L. D. Fricks in command.

The following is a summary of the vessels entering Mobile quarantine during the year, with the persons on board and their disposal:

Total vessels entering quarantine	756
Sailing vessels	206
Steamers	550
Vessels inspected and passed	685
Vessels fumigated	50
Vessels disinfected	9
Vessels detained in quarantine	6
Vessels held to complete quarantine	13
Total number persons entering quarantine	14, 875
Total number in crews entering quarantine	14, 405
Total number of passengers entering quarantine	470
Total number detained for observation	389
Total number sick in quarantine	52
Total number of quarantine diseases (smallpox)	4

During the year 4 cases of smallpox were isolated in quarantine. None of these came from the same vessel, but all of them were quarantined between March 1 and May 30. The presumably infected quarters on board the different smallpox vessels were disinfected, all contacts vaccinated, and the vessels allowed to proceed.

Owing to the appearance of yellow fever at Port Limon, Costa Rica, the first week in July, the crews of all fruiters arriving from that port were removed at Mobile quarantine, the living quarters fumigated, and relief crews placed on board.

This procedure was continued until the close of the quarantine season. No case of yellow fever was discovered in quarantine and no suspicious case appeared from Limon.

The *Zeta*, an 8-horsepower gasolene life-saving surfboat, was placed in commission as a boarding launch in November, replacing the old steam launch *Mecca*.

Pascagoula (Miss.) quarantine.—Acting Asst. Surg. B. F. Duke in charge.

Nine steamers and 111 sailing vessels were inspected and passed. These vessels carried 1,110 passengers and crew.

Gulf quarantine station.—Post office and telegraphic address, Biloxi, Miss. Passed Asst. Surg. John T. Burkhalter in command.

The transactions were as follows: Vessels spoken and passed, 2. Disinfected and passed—steamers 17, sailing vessels 9. Inspected and passed—steamers 78, sailing vessels 85. Disinfected and held—steamer 1, sailing vessels 3. Crew inspected, 3,758, passengers inspected, 41.

This station is available for such ports in Mississippi as Gulfport, Pascagoula, Scranton, and Moss Point; also for infected vessels which may be remanded from other gulf stations.

The British steamship *Hydra* from Porto Velho, Rio Madeira (about 1,600 miles up the Amazon River) via Para, Brazil, for clearance papers, and Castries, St. Lucia, for fumigation, arrived in quarantine May 4, 1911, with history of 7 cases of malaria fever en route, and two cases in the afebrile stage on board. The British steamship *Kyleakin* from Porto Velho, Rio Madeira, via Para, Brazil, for clearance papers, and Castries, St. Lucia, for fumigation, arrived May 7 with 2 of the crew suffering with what proved to be malaria fever, of the æstivo-autumnial type. Diagnosis confirmed microscopically.

All steamers visiting this port carry a physician and the crew are required to sleep under nets and take quinine daily. Notwithstanding these precautions, practically all vessels from Porto Velho arrive here with a history of several cases of malaria fever en route or aboard.

New Orleans quarantine.—Post office address, Quarantine, La.; telegraphic address, via New Orleans, La. Passed Asst. Surg. G. M. Corput in command.

Transactions at the New Orleans Quarantine Station and the substation at Port Eads.

MAIN QUARANTINE STATION.

	No.	Tonnage.	Crews.	Passengers.
Steamers inspected and passed	864	2,226,471	32,564	9,187
Steamers spoken and passed	70	....	....	....
Steamers inspected and fumigated	94	326,075	3,431	317
Steamers detained for diagnosis	10	24,291	317	54
Steamers detained to complete 5 or 6 days	27	78,744	1,002	151
Steamers fumigated and detained 5 or 6 days	3	10,182	107	2
Steamers inspected, fumigated, and released, crew detained	10	14,372	[1] 266	[1] 2
Sailing vessels inspected and passed	4	3,425	77	9
Sailing vessels inspected and fumigated	10	9,227	150	4
Sailing vessels fumigated and detained 5 or 6 days	1	772	12	....
Total for year	1,093	2,693,559	37,926	9,726
Sick treated in hospital during year, 80.				

SUBSTATION AT PORT EADS.

Steamers inspected and passed	222	528,978	7,609	699
Sailing vessels inspected and passed	5	4,774	85	....
Total for year	227	533,752	7,694	699

[1] 232 crew and 2 passengers detained.

San Diego (Cal.) quarantine.—Acting Asst. Surg. W. W. McKay in charge.

Two hundred and eighty-seven steamers and seven sailing vessels were inspected and passed. One vessel was fumigated. These vessels carried crews aggregating 4,604, and 2,509 passengers.

Port Harford, Cal.—Acting Asst. Surg. C. J. McGovern reports as follows: Twenty-nine steamers, carrying 1,242 crew, were inspected during the fiscal year. No quarantinable diseases were observed.

San Francisco quarantine—Passed Asst. Surg. F. E. Trotter in command—Table of transactions during the fiscal year.

Month.	Vessels.											From—		Personnel.				
	Inspected.		Boarded.		Spoken.		Total.		Sulphured.		Rodents killed (number.)	Cholera and plague ports.	Yellow fever ports.	Crew.		Passengers.		In hospital.
	Steam.	Sail.	Merchant.	Government.	Steam.	Sail.	Steam.	Sail.	Steam.	Sail.				Steam.	Sail.	Steam.	Sail.	
July	39	15	5	3	....	....	47	15	5	1	104	34	7	4,060	256	3,462	1	2
August	25	17	5	2	2	....	34	17	....	6	160	25	8	2,921	331	3,443	......	...
September	44	42	5	1	....	....	50	42	7	2	870	31	5	3,311	1,474	3,539	4,130	...
October	35	25	4	5	....	....	44	25	3	3	273	31	7	5,653	993	4,466	23	...
November	42	23	5	4	....	....	51	23	7	....	204	34	10	4,579	491	2,749	222	...
December	27	9	8	2	....	....	37	9	4	3	258	17	5	3,562	113	3,965	......	...
January	34	7	6	2	....	....	42	7	8	1	176	27	9	3,065	184	3,612	1	...
February	25	18	4	2	....	1	31	19	4	3	138	29	8	2,946	313	2,960	4	3
March	42	12	5	2	....	....	49	12	12	....	851	28	12	3,415	255	2,948	1	...
April	34	6	4	4	....	....	42	6	3	1	21	24	11	3,356	79	4,422	10	...
May	34	6	6	1	....	....	41	6	5	....	99	27	7	3,222	83	4,453	10	...
June	37	19	4	1	1	1	43	20	12	1	100	36	9	3,465	307	3,344	13	...
Total	418	199	61	29	3	2	511	203	70	21	3,254	343	98	43,555	4,879	43,363	4,415	5

Vessels arriving with history of having had quarantinable diseases on board en route:

(1) *German Steamship Nicaria.*—Arrived July 6, 1910, from Europe and ports on the west coast of south Central America and Mexico, with a history of having had a case of plague removed at Callao. The case occurred in a seaman shipped at Iquique on May 13, who sickened on May 19, just prior to arriving at Eten. The vessel proceeded to Callao and landed the sick sailor. The crew was taken ashore, bathed, and their effects disinfected and the vessel thoroughly fumigated. On May 29, while at Guayaquil, a sailor was removed from the vessel with an ulceration of the axilla. Passed Asst. Surg. Parker stated on the bill of health that he would cable if the case proved to be plague. The vessel was again fumigated at Guayaquil, and on arriving at Salina Cruz was placed in quarantine and fumigated for two days by the Mexican authorities.

The vessel arrived at this port on July 6, without any history of any illness since leaving Guayaquil. The temperatures of the crew were taken and the vessel fumigated. A careful and systematic search of the vessel prior to fumigation disclosed no rat signs whatsoever, and the fumigation was also negative in that no rats were obtained.

(2) *American steamship Siberia.*—Arriving September 4, 1910, from Chinese and Japanese ports and Honolulu, with a history of having had a case of cholera on board at Yokohama on August 18. This case, a Hindu steerage passenger, embarked at Shanghai on August 11 and was taken sick on August 18, about one hour after the vessel had been passed by the Japanese quarantine authorities at Yokohama. The nature of the case was promptly recognized by the ship's surgeon, who notified the Japanese quarantine authorities, and the ship was sent to the quarantine station, where the crew and steerage passengers were taken ashore and bathed and effects disinfected, the steerage quarters of the vessel being carefully washed with carbolic acid. No further illness of a suspicious nature occurred on this vessel between Yokohama, Honolulu, and this port, and the vessel was accordingly passed on arrival here.

(3) *American steamship Manchuria.*—Arrived September 19, 1910, from Chinese and Japanese ports and Honolulu, with a history of having had a case of plague on board. This case, a Chinese steerage passenger from Hongkong, sickened August 27, while the vessel was at sea en route from Kobe to Shimidzu. This passenger was ashore at Shanghai on September 23. On arrival at Yokohama, August 31, the vessel was remanded to quarantine and the steerage passengers and crew taken ashore, bathed, and effects steamed and the steerage quarters on the vessel washed with a solution of carbolic acid.

Too much praise can not be given the ship's surgeon of this vessel for promptly making a diagnosis and isolating this case, the man being very thoroughly isolated in the hospital aft and no possible communication being had between the case and the rest of the passengers.

On September 16, while the vessel was en route to this port from Honolulu, a Chinese oiler died from peritonitis. This man had been sick off and on with stomach troubles since August 22 and had been examined at Honolulu. The body was on board on arrival, and a post mortem confirmed the diagnosis—general peritonitis, due to perforating ulcer of the stomach.

In view of the fact that the vessel had been fumigated at Hongkong and that the ship's surgeon had promptly recognized and isolated the case of plague, that the treatment of steerage quarters had been thoroughly done by the Japanese authorities, and as there had been no further case of a suspicious nature, the vessel was given pratique on arrival here.

(4) *American steamship Mongolia.*—Arrived December 31, 1910, from Chinese and Japanese ports and Honolulu, with a history of having had a case of smallpox on board, December 17, while at sea between Yokohama and Honolulu. The case, a Chinese steerage passenger, was promptly and efficiently isolated and the entire personnel vaccinated. The case was removed on arrival at Honolulu and the hospital fumigated.

No further case occurring, the vessel was passed on arrival here.

(5) *Japanese steamship Chiyo Maru.*—Arrived February 24, 1911, with a history of having had a case of smallpox on board, February 14. The case, a cabin passenger embarking at Shanghai, January 31, was found February 14, four days before arrival at Honolulu, with an eruption on his hands and face. The case was isolated and at Honolulu was diagnosed as smallpox. The cabin occupied by this passenger and the hospital were fumigated. On February 18, the day after leaving Honolulu, a second-class passenger, a Japanese boy of 5 years, was found by the ship's surgeon with an eruption on his body. The boy, with his mother and a friend, all occupying the same cabin, were removed and isolated in the hospital.

On the arrival of the vessel at this port, February 24, the case was examined and considered to be probably chickenpox; but in view of the fact that a case of smallpox had been previously removed from the ship, it was deemed best to take the boy and the two contacts to this quarantine station for observation and to fumigate the cabin and the hospital. The case, removed to the quarantine station, was kept under observation, and in a couple of days the physician's diagnosis of chickenpox was confirmed. Owing to the fact that the immigration authorities lacked facilities for isolating the case, the boy was kept at this station until the eruption disappeared, when he and the contacts were given a bath and their clothing disinfected.

No vessel arrived during the year with quarantinable diseases on board, and this in spite of the fact that both plague and cholera were present in Honolulu, as well as at all of the Chinese and Japanese ports touched at by the trans-Pacific liners. The success in keeping the liners free of quarantinable diseases, particularly plague and cholera, was principally due to the vigilance of the service officers at the foreign ports of call, but mention must be made of the measures taken by the quarantine officer at Honolulu in the various instances where vessels enroute to this port arrived at Honolulu with quarantinable diseases on board. Further, it is to be noted that the measures instituted at Honolulu by the quarantine officer during the two outbreaks of cholera at that port during the year were effective in preventing cases of cholera from appearing on board vessels en route to this port from Honolulu.

Vessels disinfected.—Five vessels were disinfected for the following reasons: Two on account of smallpox having developed on board; 1 transport on account of measles having occurred on board; 2 on account of plague occurring during the voyage.

Fumigation by request.—The following vessels were fumigated by request during the year for the purpose of destroying rats on board, as well as ridding them of insects and roaches: Two transports; 1 revenue cutter; 1 lighthouse tender; 4 coasting steamers; and 1 ocean steamship.

Suspects removed from vessels.—Two suspects were removed from arriving vessels, together with three contacts.

Vessels arriving.—Five hundred and eleven steamships arrived during the year, having a total of 43,555 crew, and 43,363 passengers. Two hundred and three sailing vessels arrived during the year, having a total of 4,879 crew, and 4,415 passengers. Of these 70 steamers and 21 sailing vessels have been sulphured, which resulted in the killing of 2,659 rats and 750 mice, and in addition large numbers of insects, roaches, etc.

During the year 441 vessels have arrived at this port from ports infected with plague, cholera, or yellow fever.

Four vessels were permitted to discharge their cargo under quarantine restrictions, and the quarantine officer at the next port touched at notified.

Los Angeles, Cal., quarantine station and subports.—Surg. S. D. Brooks in command. This station includes three ports for quarantine inspection of vessels: San Pedro, Redondo, and Santa Barbara (including Gaviota).

Transactions.

	Steamers inspected.	Sailing vessels inspected.	Total vessels inspected.	Vessels fumigated.	Total passengers and crews inspected.
San Pedro	51	7	58	2	2,651
Redondo	13	10	23		573
Santa Barbara	1	12	13		243

No quarantinable disease was found during the year.

The bark *Alden Bessie* was fumigated with sulphur twice at San Pedro for destruction of rats, because she had been exposed to ingress of possible plague-infected rats at dock in Honolulu.

Port Townsend (Wash.), quarantine and subports.—Passed Asst. Surg. Baylis H. Earle in command.

During the year 1 steamer was spoken and passed, having been inspected and passed at San Francisco and at Victoria, British Columbia, before arrival. One hundred and seventy-two steamers were inspected and passed and 1 detained for fumigation; and 91 sailing vessels were inspected and passed and 8 detained for disinfection, in whole or in part, as the circumstances demanded. The steamers carried a total of 14,849 members of crews and 12,661 passengers; and the sailing vessels a total of 1,352 members of crews and 47 passengers. Of the sailing vessels detained, 7 were fumigated to destroy rats and other vermin. Six of these arrived from Callao, Peru, with American bills of health, countersigned by a service officer, who stated that he had fumigated them but was unable to guarantee them as absolutely safe risks; and one arrived from Hilo, Hawaii, without having complied with the outgoing quarantine restrictions at that port. The German bark *Schiffbek* arrived during February, 61 days out from Mejillones, Chile, with 2 cases of typhoid fever on board.

The men were roommates, had been taken ill about the same time, and had been sick for several weeks, during which they had been isolated in their room by the master. The cases were reported to the city health officer, who declined to take any action. They were then transferred to the United States marine hospital and their room and effects thoroughly disinfected. The British steamship *Strathearn* arrived on June 2 from Oriental ports, via San Francisco and San Pedro, and was fumigated for the destruction of rats at the request of the quarantine officers at those ports, it having been impracticable to fumigate it at the former because of its cargo, and at the latter because of lack of facilities for handling so large a vessel. The crews of the American barks *Hecla*, in number 21, and *Star of Lapland*, in number 31, all bound for Alaskan ports, were vaccinated during May.

South Bend (Wash.) subport.—Acting Asst. Surg. Wilson Gruwell reports 5 sailing vessels inspected and passed.

Port Angeles (Wash.) subport.—Acting Asst. Surg. F. S. Lewis reports 3 steamers and 1 sailing vessel inspected and passed.

Columbia River (Oreg.) quarantine and subports.—Post office and telegraphic address, Astoria, Oreg. Passed Asst. Surg. J. M. Holt in command.

During the year 34 steamers and 50 sailing vessels were inspected and passed. These vessels carried 2,651 passengers and crew.

Ketchikan, Alaska.—Acting Asst. Surg. Henry C. Story reports as follows: 25 vessels were inspected and passed together with 686 passengers and 1,114 crew. On and after April 26, 1911, a quarantine inspection at Ketchikan, Alaska, was required of all vessels from British Columbian ports; this, on account of the prevalence of smallpox in the region of the north Pacific contiguous to the Canadian border and in certain ports of British Columbia.

Nome, Alaska.—Acting Asst. Surg. E. M. Mikkelson reports 22 vessels inspected between June 2, 1911, and October 16, 1911.

MEASURES TO PREVENT THE INTRODUCTION OF SMALLPOX FROM PORTS ON THE PACIFIC COAST INTO ALASKA.

In conjunction with other measures described in this annual report under the transactions of domestic (interstate) quarantine, the honorable the Secretary of State was requested on April 27, 1911, to instruct the United States consular officers at the ports of Victoria and Vancouver, in British Columbia, to issue bills of health, in accordance with the Treasury regulations, to vessels bound to ports in Alaska. This precaution was taken not only to prevent the spread of smallpox to Alaska, through the medium of persons who sought to escape the restrictions in the United States, but also because of the fact that smallpox had been reported more or less prevalent in British Columbia.

An officer of the service was also directed to proceed to Victoria and Vancouver for the purpose of inaugurating such measures as seemed necessary for the vaccination or certification of passengers bound from those ports to Alaska.

In order to supplement the above, orders were issued to the medical officer of the service stationed at Ketchikan, Alaska, to subject the personnel and passengers of vessels arriving from Vancouver via Victoria to such an inspection as would enable the determination of the presence of smallpox on board and as would also determine that the vessel had obtained a bill of health required at the port of departure, and if the vessel were found free from disease, he was to issue the regular quarantine pratique.

MEASURES INSTITUTED AT SKAGWAY AND EAGLE, ALASKA, TO PROTECT AGAINST THE ENTRANCE OF SMALLPOX FROM DAWSON, CANADA.

In response to a telegraphic request from the governor of Alaska on June 23, 1911, that measures be instituted to protect Alaska from infection from smallpox from Dawson, Passed Asst. Surg. Milton H. Foster, who is on special detail with the board of education of Alaska, was directed on June 23 to proceed from Seward to Juno, Alaska, to confer with the governor, and afterwards to proceed to Dawson, investigate the smallpox conditions at that place, and then return to Skagway and Eagle City, and nominate, place on duty, and instruct the acting assistant surgeons at these places in the quarantine measures necessary to the prevention of the introduction of the disease through the medium of southbound passengers from Dawson, and also for the eradication of the disease should it gain an entrance. These acting assistant surgeons were instructed to enforce paragraph 139 of the quarantine regulations, 1910, which reads as follows:

> Persons coming from localities where smallpox is prevailing shall not be allowed entry without vaccination unless they are protected by a previous attack of the disease or a recent successful vaccination. The baggage of persons from such localities shall be inspected, and, if necessary, disinfected.

TEXAS-MEXICAN BORDER INSPECTION.

El Paso, Tex.—Acting Asst. J. W. Tappan reports that during the year 9,000 passengers were inspected.

Four cases of smallpox, 2 of typhus fever, and 2 of leprosy were detected and refused admission and were returned to the Mexican health authorities of Ciudad Juarez, Mexico.

The death certificates and containers for 8 cadavers were examined and permission given for their entrance into the United States.

One thousand seven hundred and forty-seven vaccinations were performed during the year, the greater part of these being done at the time of the refugee movement from Mexico during the revolution.

Eagle Pass, Tex.—Acting Asst. Surg. Lea Hume reports that during the year 9,652 passengers were inspected.

Laredo, Tex.—Acting Asst. Surg. H. J. Hamilton reports that during the year 752 passenger trains, carrying 50,115 passengers, were inspected; 11,661 aliens were inspected, and 584 persons were vaccinated. The death and embalming certificates, together with containers for 7 cadavers, were inspected, and 538 persons were vaccinated.

Brownsville, Tex.—Acting Asst. Surg. G. D. Fairbanks reports no transactions during the fiscal year.

SUPPLEMENTAL INSPECTION SERVICE AT MOBILE, ALA.

This inspection service, similar to the one maintained at New Orleans, has been conducted by Surg. G. M. Guiteras. All the personnel of vessels arriving at Mobile from the Tropics were held under observation after having passed the regular inspection at the quarantine station. The transactions from July 1, to October 31, 1910, are as follows:

Number of vessels arriving	178
Number of times inspected	278
Number of passengers entering Mobile	146
Number of passengers for New Orleans	45
Number of passengers for other points	67
Number of passengers from New Orelans	27
Number of passengers remaining in Mobile	34
Number of seamen discharged	535
Number of sick removed from vessels	21
Number of crew inspected	6,405

During the season of 1911, owing to the improved sanitary conditions in the Mexican Gulf and West Indian ports, this sanitary inspection service was discontinued. The necessary officers and equipment are in readiness, however, for resuming this work on short notice should conditions warrant.

Table giving transactions at national quarantine stations for the fiscal year ending June 30, 1911.[1]

Stations.	Steamers inspected.	Sailing vessels inspected.	Total vessels inspected.	Vessels spoken and passed.	Vessels quarantined.	Vessels fumigated.	Total passengers and crews inspected.
Alexandria, Va	....	6	6	....	....	....	79
Beaufort, S. C	2	3	5	....	....	....	74
Biscayne Bay	34	115	149	303	....	....	7,439
Bocagrande, Fla	5	....	5	15	....	....	134
Brunswick, Ga	20	23	43	34	....	....	113
Cape Charles	487	13	500	....	4	8	43,310
Cape Fear	50	6	56	....	3	13	1,568
Charleston, S. C	134	6	140	....	....	....	5,350
Columbia River, Oreg., and subports	34	50	84	....	....	5	2,651
Coos Bay (substation)	0	0	0	....	....	....	0
Cumberland Sound	109	28	137	82	....	1	4,023
Delaware Breakwater	26	16	42	....	....	1	2,098
Eastport, Me	843	55	898	....	....	....	56,804
Eureka, Cal	9	....	9	....	....	....	232
Georgetown, S. C	....	4	4	....	....	....	30
Gulf quarantine	78	85	163	2	4	26	3,799
Key West, Fla	259	70	329	....	....	2	29,761
Knights Key, Fla	79	0	79	....	....	....	10,698
Ketchikan, Alaska	25	0	25	....	....	....	1,800
Mobile, Ala	550	206	756	....	19	59	14,875
New Orleans, La	864	4	868	70	51	118	47,652
Pascagoula, Miss	9	111	120	1	....	....	1,110
Pensacola, Fla	118	75	193	24	1	34	6,767
Perth Amboy, N. J	71	4	75	10	....	4	1,807
Port Angeles, Wash	3	1	4	....	....	....	29
Port Eads (substation New Orleans)	222	5	227	....	....	....	8,393
Port Harford, Cal	29	0	29	....	....	....	1,142
Port Inglis, Fla	16	8	24	24	1	3	508
Portland, Me	130	62	192	1	....	....	15,561
Port Townsend, Wash., and subports	172	91	263	1	9	....	28,909
Reedy Island	1,141	92	1,233	16	....	4	95,088
Redondo, Cal	13	10	23	....	....	....	573
San Diego, Cal	287	7	294	....	....	1	7,113
San Francisco, Cal	418	199	617	95	....	91	96,212
Santa Barbara, Cal	1	12	13	....	....	....	243
San Pedro, Cal	51	7	58	....	....	2	2,651
Savannah, Ga	156	4	160	91	1	....	5,020
South Bend, Wash	....	5	5	....	....	....	70
St. George Sound	....	49	49	....	....	3	382
St. Johns River	81	....	81	252	....	....	1,308
Tacoma, Wash	52	....	52	....	....	1	1,374
Tampa Bay, Fla	95	124	219	4	3	44	5,593
Total	6,673	1,556	8,229	1,025	96	420	512,343

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[1] A number of the smaller stations at which there were no transactions are omitted from this table.

Table giving foreign, oriental, and insular stations, and transactions for fiscal year ended June 30, 1911.

Stations.	Total number of vessels inspected.	Number of vessels fumigated.	Total number of passengers and crews inspected.
Amoy, China	47	....	8,028
Arguadilla, P. R	5	....	218
Arecibo, P. R	17	....	863
Arroyo, P. R	0	....	0
Bluefields, Nicaragua	36	....	1,341
Bocas del Toro, Panama	98	....	7,612
Bridgetown, Barbados	186	51	13,863
Calcutta, India	56	56	3,354
Callao, Peru	150	141	18,259
Castries, St. Lucia	126	88	3,886
Cavite, P. I	16	0	2,539
Cebu, P. I	176	....	11,207
Ceiba, Honduras	87	0	1,979
Cienfuegos, Cuba	280	....	8,355
Coatzacoalcos, Mexico	208	33	10,127
Fajardo, P. R	48	0	441
Guanica, P. R	2	....	46
Guayaquil, Ecuador	91	76	8,000
Habana, Cuba	816	0	84,723
Hilo, Hawaii	67	48	3,812
Hongkong, China	440	89	69,591
Honolulu, Hawaii	391	98	116,739
Humacao, P. R	20	0	160
Iloilo, P. I	232	77	15,370
Jolo, P. I	16	0	910
Kahului, Hawaii	17	0	1,400
Kobe, Japan	271	27	56,161
Koloa, Kauai, Hawaii	21	....	1,790
La Guaira, Venezuela	112	....	18,715
Lahaina, Maui, Hawaii	33	0	4,362
Libau, Russia	15	....	22,047
Livingston and Puerto Barrios, Guatemala	106	0	5,599
Makaweli, Hawaii	11	0	1,136
Mahukona, Hawaii	25	0	2,878
Manila, P. I	741	303	120,868
Matanzas, Cuba	142	0	5,870
Mayaguez, P. R	63	2	8,020
Naples, Italy	271	....	131,640
Palermo, Italy	....	....	22,142
Ponce, P. R	61	28	18,180
Port Limon, Costa Rica	163	52	6,541
Progreso, Mexico	51	26	3,030
Puerto Cortez, Honduras	120	0	3,558
Salina Cruz, Mexico	76	65	3,773
San Juan, P. R	248	....	34,039
Santiago, Cuba	328	1	22,489
Shanghai, China	112	....	39,191
Tela, Honduras	19	0	263
Yokohama, Japan	271	54	68,808
Zamboanga, P. I	43	0	4,358
Total	6,931	1,381	996,950

LECTURE ON QUARANTINE LAWS AND REGULATIONS TO THE CLASS OF CONSULAR OFFICERS.

In accordance with what has now become customary on the part of the Consular Bureau, State Department, a request was made for an officer of the service to appear on October 9 before the class of consuls for the purpose of explaining the quarantine laws and regulations as they apply to foreign ports.

The Consular Bureau, through the agency of its representatives stationed in the various foreign ports, is constantly making itself more valuable as an aid in the prevention of the introduction of the quarantinable diseases from foreign ports into this country. Their duties consist in the issuing of original or supplemental bills of health to vessels departing from foreign ports for ports in the United States, and also in reporting by letter or by cable the appearance of or statistics concerning the quarantinable diseases in the countries in which they are stationed. Therefore a personal discussion with the consular officers, whether with individuals or before a class, is of great advantage to both the Consular Bureau and the Bureau of Public Health and Marine-Hospital Service.

The Quarantine Regulations, especially the Revised Regulations of 1910, are framed so as to allow much discretion on the part of the consular officers as to the interpretation of the paragraphs applying at the foreign ports to the various quarantinable diseases, and it is noted that during each succeeding year the consular corps as a whole is taking an increasing interest in so interpreting the quarantine regulations for foreign ports and executing their bills of health that these latter documents are considered of great value to quarantine officers of the United States in aiding them in a decision as to the sanitary status of a vessel upon her arrival at quarantine.

The explanation made by the representative of the service consisted in a general survey of the quarantine requirements at the various United States ports, and the application of said requirements of the paragraphs of the regulations applicable to foreign ports. It is also customary to give to each consular officer a summary of suggestions for the application of the quarantine laws and regulations at the special port to which he is destined. The consular officers are invited to ask questions concerning the interpretation of the various paragraphs of the regulations, and the Consular Bureau officers invariably suggest cases which have come up for decision in connection with the work, and the said decisions are stated and discussed. In addition to this the necessary literature in pamphlet form is furnished to the consular officers for reference.

INSULAR QUARANTINE.

OPERATIONS OF THE SERVICE IN THE PHILIPPINE ISLANDS.

Personnel.—During the year there have been a number of changes among the commissioned medical officers of the service stationed in the Philippine Islands.

Passed Asst. Surg. Victor C. Heiser continued to act as director of health and chief quarantine officer for the Philippine Islands until February 28, 1911, when he returned to the States on leave via German New Guinea, Australia, and Italy. During his absence Passed Asst. Surg. Carrol Fox is acting director of health and chief quarantine officer.

Passed Asst. Surg. Allan J. McLaughlin, detailed for exclusive duty with the bureau of health as assistant director, was relieved and ordered to the States in July, 1910, and was succeeded by Passed Asst. Surg. Carroll Fox.

Another commissioned officer was relieved in December and an officer sent to take his place four months later.

At the end of the fiscal year the official personnel of the service in the islands was as follows:

Manila: Passed Asst. Surg. Victor G. Heiser, chief quarantine officer for the Philippine Islands (on leave). Passed Asst. Surg.

Carroll Fox, chief quarantine officer for the Philippine Islands; Asst. Surg. Robert Olesen, Asst. Surg. D. C. Turnipseed, Pharmacist and Chief Clerk N. C. Comfort (acting superintendent of the Philippine general hospital).

Mariveles: Acting Asst. Surg. Wm. J. Linley (physician to the municipality of Mariveles, Province of Bataan).

Cebu: Passed Asst. Surg. H. G. Ebert.

Iloilo: Asst. Surg. J. R. Hurley (acting district health officer for the Island of Panay).

Zamboango: Acting Asst. Surg. Thomas J. Leary.

Jolo: Acting Asst. Surg. W. F. Lewis.

Cavite: Acting Asst. Surg. Allen E. Peck.

Olongapo: Acting Asst. Surg. Geo. H. Barber.

General.—Despite the proximity of the Philippine Islands to many infected foreign ports and the almost daily arrival of vessels from these ports the quarantine service conducted by the officers of the United States Public Health and Marine-Hospital Service has been an effectual barrier to the entrance of quarantinable disease. Moreover, the service has been active in assisting the officials engaged in public-health work and cooperating with the different bureaus of the insular government. The service is an important adjunct in the fight being made against disease in the Philippine Islands.

There has been no time since the American occupation when so much has been expected of the service in the Philippines as during the past year; this on account of the freedom of the islands for so long a period from any of the great epidemic and quarantinable diseases. The commercial interests and governmental authorities looked to the service to keep out the diseases which were so severely epidemic in nearly all the near-by foreign ports and countries. The sanitary condition of the Philippine Islands is constantly improving. Noteworthy mention should be made of the opening of the new Philippine general hospital, a 500-bed institution of magnificent proportions and modern equipment. The hospital has now over 300 patients and a nurses' training school of 180 pupils. A new tuberculosis hospital for incipient cases and a hospital for advanced cases has also been established. New hospitals are in course of erection at Cebu and Bontoc, and a sanitarium at Sibul Springs is also to be built.

Cholera.—Cholera was present not only in the Philippine Islands but also in many of the neighboring foreign ports. The epidemic in the Philippines was confined almost entirely to the Island of Luzon.

In Manila sporadic cases appeared until the latter part of 1910. Many of the cases were imported from the near-by infected Provinces, but at no time did the disease assume alarming proportions.

In January, 1911, the disease entirely disappeared from the city of Manila. It likewise disappeared from all of the Provinces, except Albay, late in January, 1911. In March the Province of Albay finally became clear of the disease, and since that time there have been no cases in the archipelago.

At different times during the year cholera was successively reported at Kobe, Nagasaki, Tokio, Singapore, Java, and Amoy. Upon the receipt of these advices circular letters were issued to the service officers in the Philippines and vigorous efforts made to prevent a reinfection of the islands.

In November, 1910, the Japanese steamer *Chicago Maru* landed 1 patient suffering with cholera in Nagasaki immediately prior to sailing for the Philippines, but the facts did not become known until it was too late to institute appropriate measures in Manila. Fortunately, there was no extension of the disease.

A number of local vessels having cases of cholera aboard were disinfected, and after such treatment no further cases occurred.

During the time that cholera was present in Manila vessels from that port were required to undergo inspection at Iloilo prior to landing passengers or cargo. This embargo was removed as soon as the disease was controlled.

Leprosy.—It is still necessary to make occasional voyages throughout the Philippine Archipelago for the purpose of collecting the lepers, who are reported from time to time, and conveying them to the island of Culion.

It is becoming more and more apparent that leprosy is a house and family disease, for it is not rare to find entire families afflicted. The discovery of this intimate relation has been of actual value in diagnosing incipient cases, and in keeping the other members of the family under clinical and bacteriological surveillance.

Probably no vessels are subjected to such strenuous treatment as those that have carried lepers. All passengers and members of the crew are bathed, their effects, all bedding, table linen, rugs, curtains, cushion covers, and awnings disinfected with steam. All state rooms, closets, pantries, even the pilot house, are disinfected with formalin. The forecastles and holds are fumigated with sulphur.

There are about 2,200 lepers at the Culion Leper Colony at the present time. Reenforced concrete buildings are gradually replacing the more frail bamboo structures, and give the locality an appearance of permanence.

The hospital at Culion is a building which would reflect credit upon any large community in the United States. For an abundance of light, ventilation, and freedom from odor, the hospital is unexcelled.

The treatment of leprosy by salvarsan has proved unsuccessful, and removes another promising remedy from the thoroughly explored field of therapeutics.

During the past year two Filipino lepers were discovered at incoming quarantine inspection, they having attempted to reenter the Philippines from obscure foreign ports. It was not known to the officers or passengers of these vessels that these persons were lepers, as there were but few external evidences of the disease. One of the patients had been pronounced free from the disease by one of Japan's greatest bacteriologists and a number of other physicians of prominence in both Japan and China; yet there was no difficulty in demonstrating the bacillus of leprosy in the scrapings from the nasal septum.

One of the interisland vessels has conveyed lepers from the southern islands to Manila upon several occasions, with the permission of the service. After these voyages the quarters occupied by the patients have been thoroughly and efficiently disinfected.

Plague.—While the Philippine Islands have been literally surrounded by and in almost daily communication with plague-infected ports, no case of rodent or human plague has gained entrance during the year. Practically every vessel has touched at one or more infected ports prior to arriving in the Philippines.

The service officers stationed at oriental ports have rendered notable assistance in preventing the introduction of plague by frequent fumigation, rigid inspections of passengers and crews (often excluding persons from passage because of elevations of temperature), and by passing upon the cargo before it is taken aboard the vessels.

Besides the periodical fumigation of all local vessels, and such foreign vessels as became empty in the Philippines, definite antiplague measures have been instituted in other directions.

Before a vessel from a plague-infected port is permitted to proceed to a dock the attention of the master is directed to the terms of the pratique. It is provided that (1) the vessel shall be fended off 6 feet from the dock; (2) rat guards shall be worn on all lines leading to the dock and to lighters alongside; (3) all gangways shall be raised and all lighters and boats removed from alongside between sunset and sunrise.

An inspection is made by a medical officer late every afternoon for the purpose of observing the methods of complying with the regulations. At first considerable difficulty was experienced in enforcing the requirements, but as ships' officers, customs inspectors, wharfingers, and other responsible persons were educated to the importance of rigidly observing the antiplague precautions, gratifying improvements became noticeable.

Patent fenders, which are swung out of the way when not in use and are raised when a vessel is alongside, have been installed and are proving very useful in fending off.

The rat guards imported from San Francisco, which proved to be heavy, unwieldy, difficult of adjustment, easily damaged, and exceedingly expensive, have been replaced by light, tight-fitting guards of the spool variety.

It was found that the stone riprap along the water front was heavily infested with rats. During the effort made to discover the source of the food supply of the rodents it was noticed that garbage was constantly floating in from the bay and being deposited upon the riprap. At the request of the service the insular collector of customs issued an order to all vessels in the bay prohibiting the throwing overboard of garbage. In addition to thus cutting off their food supply, a number of men were detailed to trap and poison the rats infesting the riprap. Steps were also taken to insure the reconstruction of the garbage boxes outside of the docks and to provide for the frequent and prompt collection of the garbage placed therein. A grain storehouse of the United States Quartermaster's Department furnished abundant food for rats along the water front after other sources had been curtailed. When the circumstances were explained to the Army officer in charge, he promptly placed a number of men at the disposal of the service for the purpose of aiding in the campaign of extermination.

By creating a rat-free zone around the Government piers and keeping the local craft, which continually lie alongside vessels from infected ports, clear of rats, it is hoped to minimize the danger of the spread of rodent plague, should an infected animal succeed in leaving the vessel.

Because of the increase of plague in ports with which Manila has frequent and extensive communication, it became necessary to impose a quarantine of seven days upon persons coming from Amoy and steerage passengers from Hongkong. Shortly after the declaration of the quarantine against Amoy, a case of plague was detected among the passengers of one of the vessels from that port., Under appropriate treatment there was no extension of the disease.

Passengers and crews of vessels from Saigon and Phnom Penh, in Cochin China, both plague-infected ports, are not permitted to land in the Philippine Islands until seven days have elapsed from the time of leaving those ports.

As reports were received of the prevalence of plague at oriental ports, the quarantine officers in the islands were notified by circular letter to exercise extra precautions and institute appropriate measures when handling boats from such ports.

Frequent examinations for plague infection have been made among the rats trapped and poisoned in different sections of the city and along the water front, but no infected rodents have been discovered.

Smallpox.—Smallpox in the Philippine Islands is becoming notably mild and infrequent in the more accessible communities. There has been no death from smallpox in the city of Manila since June 15, 1909. Owing to the policy of persistent vaccination and revaccination, smallpox assumes but little importance in the service operations.

At Cebu smallpox was encountered on two vessels, and at each Manila and Zamboanga on one vessel.

After the vaccination and disinfection of the effects of all the persons exposed to the contagium, the vessels and everyone, except the actual sick, have been released. This exceedingly simple treatment has been sufficient in every instance to check the progress of the disease.

At Mariveles two cases of suspected varioloid were discovered among the passengers held for observation on account of coming from plague-infected ports. As vaccination in both these cases resulted positively, and the cutaneous affection ran an atypical course, a final diagnosis of impetigo contagiosa was made. Another person in the group was detained because of the appearance of a suspicious eruption, but which proved to be erythema multiforme.

Bills of health.—There were issued during the year 149 consular bills of health to vessels going to ports in the United States, 1,448 to local vessels proceeding to interisland ports, and 765 to vessels bound for foreign ports, a total of 2,362 bills of health.

During the prevalence of cholera in Manila the masters of vessels departing for other ports in the Philippine Islands were required to sign an agreement, stamped in red ink upon the face of the bill of health, to proceed to the nearest quarantine station upon the appearance of suspicious illness among the persons on board the vessel.

The practical workings of this plan were demonstrated by the arrival of the steamer *Batangueño* from open sea with the body of a man who had died immediately before the vessel's arrival at the Mariveles quarantine station. The autopsy showed death to have been due to cholera, and the institution of prompt measures checked the extension of the disease.

The foreign consulates in Manila still display their confidence in the bills of health issued by the service by simply viséing them.

Considerable confusion continues to obtain at foreign consulates and on the American mainland with regard to bills of health. The recommendation made that only one blank for bills of health be substituted for the original and supplemental is, after the inspection and issuance of an additional 2,500 bills of health, further emphasized.

Outgoing quarantine.—Prior to placing cargo aboard a vessel bound for a port in the United States a written description of the cargo is brought to the quarantine office for approval. The origin and sanitary history of personal effects, curios, and similar articles are invariably investigated before permission is granted for their shipment.

When an application is made for a bill of health for a vessel intending to sail for a port in the United States, the following notice is brought to the master's attention:

NOTICE OF OUTGOING QUARANTINE INSPECTION.

The master and agent of the steamship ———.

Just prior to the departure of your vessel from Manila the United States quarantine officer will inspect the crew and passengers on board the vessel.

One hour before the time for sailing, when all members of the crew, all passengers, the Manila bill of health in triplicate, and the manifest of cargo are on board, you will please hoist the "D" flag of the international code as a signal of readiness for this inspection.

Just before the vessel sails all members of the crew and all passengers are mustered, inspected, and, if found free from quarantinable disease, the fact is noted upon the bill of health. The manifest is also examined and compared with the boat notes presented and passed upon at the quarantine office. If the shipment of the articles named in the manifest is approved, this fact is also noted upon the bill of health. Medical officers at other ports may thus learn of the action with regard to the cargo by scanning the bill of health.

Whenever possible, vessels proceeding to the States have been required to be fumigated, or, in the instances of Army transports, to be partially disinfected, prior to taking on cargo or passengers. In many instances it has been impossible to perform the fumigation because of the presence of transit cargo and passengers. Other vessels are fumigated at foreign ports and arrive at the Philippines in ballast, ready to load cargo.

Consular bills of health were issued to 149 vessels departing to ports on the mainland of the United States. Of these, 35 were fumigated throughout and 13 Army transports were partially disinfected prior to their departure from the islands.

Buildings and equipment.—It has been the aim to replace gradually the rapidly deteriorating wooden buildings at Mariveles with reenforced concrete structures as the appropriations became available. The concrete houses erected by the Spaniards, who had a quarantine station at Mariveles prior to the American occupation, and which are now used as officers' quarters and administration buildings, are in excellent condition, and, with the exception of some new floors, will require no repairs.

Two reenforced concrete barrack buildings have been completed and are in use. These structures are fitted with galvanized-iron bunks and canvas bunk bottoms, making a highly sanitary combination.

During the coming year another concrete building to replace the present attendants' quarters will be built. In view of the increased number of autopsies performed at Mariveles, it is also deemed advisable to provide a concrete autopsy building.

The dock at Mariveles, owing to the action of teredos upon the piles beneath the surface of the water, is in need of extensive repairs. The appropriation for this work is available, and will be pushed to completion as soon as the material can be obtained.

Extensive repairs have been made upon all the wooden buildings by the regular station force.

The water system, than which there is no better in the Philippine Islands, has been kept in excellent condition by cleaning the reservoirs, renewing screens, repairing and repainting pipe lines.

During the year 425 galvanized-iron pans, for use in fumigation, boxes, window guards, chairs, and a special multiple-pan sulphur furnace have been made at Mariveles for the use of the service in Manila.

With spacious and closely cropped green lawns, immense shade trees, white-painted, well-kept, and fully equipped buildings, Mariveles is unquestionably the most attractive and complete quarantine station under the supervision of the service.

At Iloilo, it is the intention to remove all of the disinfecting machinery from the barge *Esmeralda* and install it in a concrete building to be erected on shore, near the mouth of the Iloilo River. In addition to providing a place for disinfecting clothing and bathing persons exposed to infection, there will be sufficient space for the care of several cases of dangerous communicable diseases, an institution long needed at Iloilo. The barge *Esmeralda*, which is a constant source of expense and grave concern, will then be abandoned.

At Cebu, the breakwater at the south end of the Island of Cauit has been reenforced with coral rock laid in cement mortar, thereby lessening the erosion by the waves. The tower of the windmill, which was rapidly decaying, has been concreted up to the tank, insuring a solid and permanent base. The repairs to the small boats have been made by the station force.

A number of rotten piles under the dock at the quarantine station at Cebu have been replaced with creosoted piles imported from the States. These piles seem to withstand the ravages of the teredo and dry rot very well.

Laboratory at Mariveles.—At the Mariveles Quarantine Station, a complete pathological and bacteriological laboratory, with modern and adequate equipment, is maintained. The laboratory is prepared to make immediate microscopical examinations, prepare and incubate cultures obtained at autopsies and from persons under observation in the hospital.

The value of having an up-to-date laboratory was demonstrated at the time of the case of plague on May 25, 1911. In order to secure an absolute confirmation of the diagnosis, smears, stained specimens, and cultures were prepared and sent to the Bureau of Science in Manila.

The medical officer at Mariveles has also made frequent examinations of the blood and stools of the natives in the neighboring barrio for diagnostic purposes.

Immigration.—The immigration examinations in the Philippine Islands are conducted by the quarantine boarding officers immediately after the incoming quarantine inspection has been completed. The passenger manifest is scanned, and all aliens, with the exception of the Chinese, are subjected to an examination for the purpose of determining whether they are suffering from diseases which render them liable to deportation under the immigration laws.

In the instances of foreign vessels calling at several Philippine ports the examinations are conducted at the first port of entry.

Only those Chinese are examined who are designated by the immigration authorities, because almost all of these persons are returning merchants and laborers with certificates of previous residence. In spite of the discontinuance of the examinations by medical officers of this service at ports of embarkation it is evident that extreme care is being exercised by the steamship companies to prevent the embarkation of persons who may be refused landing in the Philippines. The expense incurred through the rejection and return of passengers is sufficient to encourage the companies to require thorough medical examinations.

There has been a decided increase in the number of Japanese immigrants coming to the Philippine Islands, but so carefully have they been examined before their departure from Japan that it is rare to discover anyone suffering from a deportable disease.

As compared with previous years, there has been a decided general decrease in the number of arriving aliens. Of the 3,001 persons examined, 22 were certified in Manila and 11 in Iloilo, all for trachoma.

Vaccination.—In Manila special attention has been directed toward completing the vaccination of the crews of lighters, cascos, schooners, launches, and steamers engaged in local and interisland trade. After several months of steady application the work has been completed and offers a stout resistance to the importation of smallpox from other insular ports. However, in order to maintain this desirable condition of affairs it will be necessary to institute continuous vaccination, because the crews are constantly changing.

It is interesting to note that one of the few vessels which escaped vaccination, owing to making numerous foreign voyages, reported the ocurrence of a case of smallpox among the crew. The case was discovered when the vessel returned to Zamboanga from Borneo. The vessel was remanded to Cebu, the nearest quarantine station, for appropriate treatment.

During the prevalence of plague at neighboring foreign ports vaccinations have been postponed until the passengers have arrived in the Philippine Islands. Otherwise the vaccinations have been performed at the ports of departure. During the past year all passengers from Amoy have been vaccinated upon their arrival in Manila. Owing to the fact that these persons are not seen again after the vaccinations have been performed it is impossible to determine the results. It is probable, however, that the percentage of "takes" is exceedingly small, for nearly all of the Chinese have from two to five scars denoting recent successful vaccinations.

Even in these cases it is believed to be entirely justifiable to revaccinate as often as the persons return to the islands, as the recurrence of smallpox in the same person is a thing not unheard of in the islands. In the instances of the unvaccinated Chinese infants and children coming into the Philippines for the first time it is highly important that they be afforded protection against smallpox, and it is in these cases that particular care is used to insure positive results.

In Cebu the crews of the local vessels have been vaccinated by the district health officer as part of a general campaign of vaccination in the Province of Cebu.

In Iloilo a corps of five municipal sanitary inspectors have been engaged in thoroughly vaccinating the people of the city. Vaccinations were also performed at the offices of the presidente de sanidad and the district health officer, and by the several hospitals and private physicians. This combined activity has changed a city that was formerly a hotbed of smallpox into a locality which is scarcely, if ever, troubled by the scourge. When smallpox was imported into Iloilo last January there was no spread of the disease and no difficulty in handling the situation.

Fumigation.—With the institution of a new system of record keeping the number of fumigations performed in the Philippines is steadily increasing each successive year. This system, of the card-index order, is an insistent reminder of the necessity of performing the semiannual fumigations of all local and foreign vessels.

The system is the acme of simplicity. As it is largely with the local vessels that the service is concerned, a definite and regular procedure is necessary. The steps are as follows:

(1) Every vessel entering a Philippine port without quarantine inspection is required to present a "certificate of arrival" at the quarantine office within one hour after arriving in port.

(2) If the vessel is due for fumigation, as will be shown by the card-index system, a "fumigation due" notice is given to the person presenting the certificate.

(3) After the vessel has been fumigated the master is required to render a report upon a prescribed form, giving the number of rats, mice, ants, cockroaches, and other animals exterminated by the process of fumigation.

(4) The results of the fumigation, together with the vessel's name, rig, tonnage, number of pots of sulphur used, number of holds and location, and other pertinent information, is recorded on a card. Each card has sufficient spaces for keeping the records of four and one-half years of regular semiannual fumigations.

The cards are kept in chronological order, so that the cards gradually work forward, and, at the proper time, serve as reminders for the next fumigation.

The results of the fumigations during the year have been highly gratifying and indicate a decided diminution in the rat population aboard the vessels in the Philippine Islands.

In Manila the reports received show that there were killed 2,140 rats, 715 mice, 67 buckets of cockroaches, 11 buckets of ants, 21 centipedes, 21 lizards, 21 spiders, 2 frogs, 1 scorpion, and 2 cats. An average of 10 rats were killed on each vessel fumigated in Manila.

In Iloilo 248 rats, 6 buckets of cockroaches, 24 centipedes, and 3 scorpions were killed on 69 vessels, and 114 rats were killed on 35 vessels at Cebu, the number of rats being less because the vessels were smaller

The number of rats destroyed is very much less than during the preceding year, and demonstrates the beneficial and lasting results of fumigation. It was also noticeable that rats are becoming very scarce on the foreign intercontinental freighters. It is probable that the reports received of rats exterminated are not strictly accurate, as there is often difficulty in finding the bodies of the dead rodents until several days have elapsed.

During the year 403 vessels were fumigated at the four quarantine stations in the Philippine Islands, 275 at Manila, 69 at Iloilo, 35 at Cebu, and 24 at Mariveles. Of these, 326 were vessels engaged in local or interisland commerce, 42 came from foreign plague-infected ports, and 35 were treated preparatory to loading cargo for ports in the United States.

Upon the request of the insular bureau of agriculture 5 vessels, infected by diseased cattle, have been fumigated.

In the instances of foreign vessels, the dates and places of fumigation are obtained from the bills of health and entered upon separate cards. When the information can not be obtained from the bill of health and there is no certificate of fumigation at hand correspondence is had with the agents of the vessel and the American consuls at the ports at which the vessels become empty. In this way a check is kept on all vessels coming to the islands.

Rice-carrying vessels from foreign plague-infected ports are fumigated after the vessel has been discharged.

All vessels intending to sail for ports in the United States are required to undergo fumigation before loading cargo.

Besides markedly reducing the possibility of the introduction of plague into the islands, fumigation has minimized the loss resulting from the ravages of rats upon cargo, stores, and equipment, and, by destroying myriads of ants and cockroaches, made life aboard ship more endurable for passengers and crews.

Until there is a notable increase in the amount of fumigation done at ports in the United States it will be impossible to subject trans-Pacific vessels to satisfactory treatment and afford adequate protection against plague. But few of these vessels become empty in oriental ports, thus offering no opportunity for a complete and simultaneous fumigation. On the other hand, many of them completely discharge all cargo and land all passengers in United States ports. It would seem logical, then, to have the work done there, but such is not the case. One of the largest Pacific liners came into the port of Manila during the year with so many rats on board that they abounded even in the first-class staterooms, yet it was impossible to subject the vessel to fumigation, because a large number of transit passengers were carried, as well as considerable perishable cargo.

The service in the Philippines is doing everything possible to protect the mainland of the United States, but at the present time is placed in the incongruous and exceedingly unsatisfactory position of performing partial fumigations in Manila and permitting the work to be completed in Chinese and Japanese ports.

Floating equipment.—In Manila practically all the boarding work and the fumigation is done with the *Zapote*, a steam launch 86 feet in length, which has been thoroughly overhauled recently and is in excellent condition. This launch frequently makes the 27-mile trip to Mariveles for the purpose of carrying cement for the construction work and other supplies for the quarantine station.

The *Mercury*, a smaller launch, on which steam may be raised within a few hours, is used in emergencies and when repairs are being made to the larger launch.

The steam launch *Mariveles*, in Iloilo, has recently been furnished with a new boiler, the machinery and hull overhauled, and the vessel generally placed in first-class condition.

The disinfecting barge *Esmeralda* is in poor condition, and an effort is being made to obtain an appropriation for the purpose of constructing a disinfecting building somewhere along the river in Iloilo, so that the hulk may be abandoned. One of the Kinyoun-Francis steam chambers has been removed from the *Esmeralda* and installed in the San Lazaro Hospital, in Manila, where much valuable work in disinfecting the clothing of contagious-disease contacts may be done.

The steam launch *Sanidad* is used for boarding vessels coming to Cebu and also for conveying supplies from the city of Cebu to the island of Cauit, where the quarantine station is located.

With the establishment of quarantine against Amoy and Hongkong, the naphtha launch *Nanon Dean* is used frequently for boarding vessels arriving in Mariveles Bay.

With the exception of the *Mariveles*, which underwent extensive repairs and is now in splendid condition, all of the vessels of the service have been in commission during the entire year.

Interisland quarantine.—One of the most important innovations in quarantine procedure that has been made since the American occupation was initiated December 24, 1910. Vessels from foreign ports, which have undergone quarantine inspection at a Philippine port of entry, are not required to await quarantine inspection upon arrival at other Philippine ports, provided:

(1) That a period of seven days has elapsed since leaving the last foreign port.

(2) That in case any sickness has occurred aboard the vessel the master will hoist the quarantine flag and await quarantine inspection prior to landing passengers, crew, or cargo.

(3) That within one hour after the vessel's arrival in port the master will file at the quarantine office a certificate stating that the vessel is in a clean and sanitary condition, and that there has been no sickness on board during the preceding five days.

(4) That before departing from a port in the Philippines a bill of health be obtained at the quarantine office.

This ruling has placed foreign vessels operating in the islands upon practically the same basis as interisland vessels and has greatly facilitated the progress through the port routine. In the instance of one agency which persistently failed to file the required certificate of arrival, the incoming quarantine inspection was again demanded of all its vessels.

During the period that cholera was present in Manila vessels from that port were inspected upon arrival in Iloilo, but the rapid improvement in the situation caused the quarantine to be speedily removed. This was the only time during the year that there was the slightest necessity for an interisland quarantine.

Daily inspections of incoming interisland vessels are made in Manila, and, when sanitary defects are noted, the vessels are not allowed to clear until the defects have been remedied.

Disinfection of vessels.—At the several quarantine stations of the service in the Philippines 78 vessels were disinfected for various reasons.

In Manila four steamers were disinfected on account of having had persons suffering with cholera on board. The crews and passengers were bathed and their effects disinfected. In two of these instances disinfection was accomplished by dipping the clothing in strong solutions of bichloride of mercury. Five vessels chartered by the bureau of health and used in conveying lepers to the island of Culion were vigorously treated. Four vessels bringing individual lepers to the city were partially disinfected. Because of the presence on board of persons with smallpox, it was necessary to disinfect four vessels. At the request of the bureau of agriculture five foreign vessels were treated in order to prevent the spread of cattle disease. Four trans-Pacific army transports, which arrived in the Philippines with measles, chickenpox, and mumps, and one with smallpox, were remanded to Mariveles for appropriate treatment at the request of the Army.

At Cebu two vessels were disinfected because of the presence of smallpox.

Two small steamers which had carried lepers from Panay ports to Iloilo for transfer to Culion were disinfected at Iloilo.

In addition to these, there were several partial disinfections done upon local craft on account of deaths from tuberculosis and other diseases when it was deemed inadvisable to await the results of the autopsies prior to proceeding with the disinfection.

There were also disinfected 42 vessels from infected foreign ports and 35 vessels prior to loading cargo for ports in the United States.

Aid rendered other services.—(1) Bureau of Agriculture: The islands are threatened constantly both from within and without by epidemics of dangerous cattle diseases which threaten to exterminate the highly important working animals.

Twice within the past year the bureau of agriculture has been compelled to deny further admission to infected cattle from neighboring countries. Therefore the service has willingly assisted this bureau in attempting to reduce to a minimum the possibility of the introduction of rinderpest and surra on vessels by subjecting a number of these vessels to thorough disinfection.

A quarantine station and matadero for the detention, observation, and slaughter of cattle is now under construction at a point about 3 miles from the Mariveles quarantine station. Through this proximity to the largest quarantine station in the Philippines the service will be in position to cooperate with the bureau of agriculture more completely than has previously been possible.

(2) Board of marine examiners: There has been a decided increase in the number of examinations to determine the physical fitness of pilots, masters, patrons, and engineers to qualify for or hold their respective positions. The work is of great importance and embodies both the primary examination of candidates and the periodical reexamination of those already employed upon the vessels. The examinations are complete and rigid, and the results are reported to the

board of marine examiners in simple medical terms in order that they may make their own recommendations.

During the year 196 applicants were examined. Of these, 170 passed and 26 were rejected.

It is particularly interesting to note the large number of ocular deficiencies encountered. During the year there were discovered 2 cases of extensive pterygium, 1 of cataract, 6 of severe trachoma, and 21 of very defective vision. In addition, there were 3 cases of complete inability to distinguish colors, 4 cases of confusion with regard to certain fundamental colors, and 3 cases of sluggish color perception. Three men were found to have defective hearing. Among the other conditions encountered upon examination, but which were not deemed of sufficient importance to cause the rejection of the applicant, were psoriasis, scabies, gonorrhea, hemorrhoids, varicocele, and valvular disease of the heart, with compensation.

(3) Bureau of health: Aid is rendered to the bureau of health in many ways. One of the most important duties of the service is to notify the bureau of health of the presence of infectious disease among the passengers of incoming vessels. Whenever such diseases as cerebrospinal meningitis, measles, chickenpox, or mumps are discovered, prompt reports are made to the bureau and the patients kept on board until they can be properly cared for in the city. Following this action, the quarters occupied by the sick persons are thoroughly disinfected.

The vessels chartered by the bureau of health for the purpose of collecting persons suffering from leprosy and conveying them to the island of Culion have been treated each time before permitting their use for other purposes.

Because of the danger of conveying serious intestinal diseases, all cabbage, lettuce, celery, radishes, and other low-growing vegetables usually eaten raw and coming from China and Japan, where human excrement is used for fertilizer, are denied entrance into the Philippine Islands.

At Iloilo the service officer has acted as the district health officer for the island of Panay, thereby rendering important assistance to the insular bureau of health in addition to performing his usual quarantine duties.

Four service officers stationed in Manila have aided in making the diagnoses and collecting several hundred persons suffering from leprosy and living in remote parts of the islands.

At Mariveles the service officer acts as physician to the adjacent municipality, and has treated several hundred natives both surgically and medically.

By far the most important aid rendered the bureau of health has been that of passing upon the authenticity of inspection certificates accompanying shipments of meat. The recently promulgated law requires that all meat and meat food products imported into the Philippine Islands must be accompanied by certificates of ante and post mortem inspection made by a competent and properly qualified veterinarian. Moreover, the authenticity of these certificates must be attested by a representative of this service, wherever there is one available, or by a United States consul.

The work of notifying the consuls in different parts of the world of these requirements and passing upon the enormous shipments of meat constantly coming into the Philippine Islands have entailed considerable extra and onerous duties upon the service.

By its willingness to perform vaccination in the several quarantine offices, insisting upon the employment of recently and successfully vaccinated crews of vessels, and vaccinating incoming passengers from infected foreign ports, the service has rendered great assistance to the general health work.

(4) Lighthouse establishment: The light displayed upon the dock at Mariveles has been of great assistance to vessels approaching the quarantine station at night. The light is cared for by the employees at the station, the night watchman seeing that it is kept burning brightly.

(5) United States Army: Year by year the practice of bathing and disinfecting the quarters and effects of homeward-bound troops has been continued. The very few cases of infectious disease that have developed among large numbers of soldiers on the voyages to the States demonstrates conclusively the efficacy of the process.

The interisland transports, launches, and lighters of the Quartermaster's Department have been fumigated at stated intervals for the purpose of destroying vermin. The surgeons of the transports have been requested to permit no member of their crews to remain unvaccinated, and, as a result, these vessels are exceedingly well protected against smallpox.

Nearly every trans-Pacific transport that has arrived during the past year has brought from 10 to 60 cases of measles, and more or less cases of mumps and chickenpox. Upon the request of the chief surgeon, Philippines Division, these vessels have been remanded to Mariveles for disinfection prior to embarking new troops.

Troops from the neighboring island of Corregidor have been bathed and disinfected in an effort to prevent the spread of measles.

A quarantine camp for 610 men, who had been exposed to measles on the transport *Logan*, was established at the Mariveles quarantine station for a period of three weeks. While several new cases developed during this quarantine, the disease was finally stamped out, and the men distributed throughout the various posts in the islands.

(6) Weather bureau: Mariveles Bay is a snug shelter just inside the entrance of Manila Bay. Upon nearing the mouth of Manila Bay vessels can ascertain the condition of the sea outside. During the typhoon season it is not unusual, after making such observations, for vessels to seek shelter in Mariveles Bay, where there is sufficient depth of water for the largest vessels and excellent protection both from wind and sea.

Whenever notified by the weather bureau of the approach of a typhoon the proper signals are displayed, both by day and night, at the station.

Statistics.—Tables of statistics showing the quarantine transactions at the different ports of the Philippine Islands, and a summary embracing the work done at all of the ports, together with a statement of the financial transactions for the fiscal year 1911, with the expenditures arranged by detail classification and by station are submitted and follow in the order named:

Summary of quarantine transactions, both incoming and outgoing, Philippine Islands, fiscal year ended June 30, 1911.

	Manila.	Iloilo.	Cebu.	Cavite.	Zamboanga.	Jolo.	Total.
Vessels inspected	741	232	176	18	43	16	1,226
Vessels detained in quarantine	66		1				67
Vessels disinfected	17	1	4				22
Vessels fumigated to kill vermin	286	76	38				400
Number rats killed	2,140	248	114				2,502
Bills of health issued	2,003	184	157	18			2,362
Pieces of baggage disinfected	52,434		267				52,701
Pieces of baggage inspected and passed	27,578		35				27,613
Pieces miscellaneous cargo certified	632,736	102,769	121,287				856,792
Cases quarantinable diseases detected on vessels	4	1	1		1		7
Persons detained in quarantine	3,421		35				3,456
Crew inspected	68,614	11,336	8,698	2,536	2,796	658	94,638
Passengers inspected	52,254	4,034	2,509	3	1,562	252	60,614
Persons vaccinated	8.128		85				8,213
Persons bathed and effects disinfected	1,203		35				1,238

There were no transactions at the ports of Balabac or Olongapo.

FINANCIAL STATEMENT.

(A) APPROPRIATION FISCAL YEAR 1911.

Appropriation, act No. 1989, Philippine Island Legislature	$62,500.00
Carried over from fiscal year 1910	4,507.685
Collections and refund credits	3,501.83
Total available	70,509.515
Expended during fiscal year 1911	49,832.455
Unexpended balance, June 30, 1911	20,677.06
Total expenditures	70,509.515

Outstanding obligations, estimated, $10,000.

(B) PUBLIC WORKS AND PERMANENT IMPROVEMENTS.

1. *Reconstruction Mariveles Wharf.*

Balance on hand July 1, 1910	$20,756.65
Addition to fund July, 1910	750.00
Total	21,506.65
Expenditures during fiscal year 1911	282.955
Balance on hand, bureau of navigation	21,223.695
Total	21,506.65

2. *Barracks, Mariveles Quarantine Station, Act 1902.*

Balance from fiscal year 1910	1,048.355
Fund authorized July, 1910	5,000.00
Total available	6,480.355
Expended during fiscal year 1911	4,988.515
Unexpended balance for finishing buildings	1,491.84
Total	6,480.355

3. *Disinfecting building at Iloilo.*

Fund authorized July, 1910	1,750.00
Balance on hand	1,750.00

TOTAL EXPENDITURES.

Current fiscal year appropriations	$49,832.455
Reconstruction Mariveles wharf	282.955
Barracks, Mariveles quarantine station	4,988.515
Total	55,103.925

DISTRIBUTION OF EXPENDITURES.

Compensation of personnel	35,410.945
Office and general service expenses	1,420.91
Launch and boat expenses	5,962.455
Station supplies and disinfectants	5,504.845
Repairs to buildings and wharves	697.64
New construction and new equipment	6,107.13
Total expenditures	55,103.925

EXPENDITURES BY STATION.

Manila:		
General service expenses	$14,678.305	
Launch expenses	5,742.17	
New station equipment	325.00	
		$20,745.475
Mariveles:		
General service expenses and supplies	12,100.65	
Repairs to buildings and wharves	594.47	
Launch expenses	161.355	
New construction and equipment	5,928.895	
		18,785.37
Iloilo:		
General service expenses	2,587.205	
Launch and barge expenses	4,101.905	
New station equipment	2.08	
		6,691.19
Cebu:		
General service expenses	5,304.75	
Launch expenses	2,813.55	
Repairs, buildings and wharves	113.67	
New construction and new equipment	119.92	
		8,351.89
Jolo:		
General service expenses		170.00
Zamboanga:		
General service expenses		360.00
Total expenditures		55,103.925

QUARANTINE IN PORTO RICO.

The chief quarantine officer for Porto Rico, Passed Asst. Surg. S. B. Grubbs, stationed at San Juan, reports for the fiscal year ended June 30, 1911, in substance as follows:

The general organization of the quarantine service for Porto Rico remains as during the previous year with the exception of the opening of the port of Guanica as a port of entry and the appointing of a quarantine officer for that place. The quarantine stations of the island now are: San Juan (headquarters), Ponce, Mayaguez, Fajardo, Humacao, Arecibo, Aguadilla, Arroyo, and Guanica. All these ports are under the supervision of the chief quarantine officer, and the more important ones are frequently inspected.

A large number of persons have been detained in quarantine (670 persons remaining 1,763 quarantine days) at the detention station at Miraflores.

Practically all of the passengers detained during the year were from Venezuelan ports; this being on account of the persistence of plague at Caracas, as well as yellow fever in La Guaira and vicinity. Plague has also been reported at Trinidad and yellow fever at Barbados, but there is very little passenger traffic between these places and Porto Rico.

As during the previous year the service representative in Venezuela has inspected the fumigation of vessels leaving La Guaira and Porto Cabello, which has greatly simplified and lessened the restrictions imposed at Porto Rican ports.

During the last few months the question of mosquito destruction, which has frequently been urged by the service officer, has taken definite form. During the month of April, Entomologist W. V. Tower, of the agricultural experiment station at Mayaguez, made a general survey of the city. His report shows that the Aedes callopus is found in all sections of the city in great numbers so that all the factors are present for an extensive epidemic should one case occur. The new insular health department that was inaugurated on July 1 has promised to take up antimosquito work, and a citizens' league has been organized to popularize the work. The service is giving as much assistance as possible and it is believed that the numbers of Aedes callopus, as well as other mosquitoes, will soon be materially decreased.

The summary of transaction for the year ending June 30, 1911, is as follows:

San Juan:

Vessels inspected	248
Vessels held in quarantine	41
Vessels disinfected	0
Passengers inspected	17,936
Passengers detained	670
Crew inspected	16,103
Bills of health issued	294

Transactions at the subports in Porto Rico.

Ponce:	
Vessels inspected	61
Vessels in quarantine	12
Vessels disinfected	28
Passengers inspected	9,964
Crew inspected	8,216
Passengers detained in quarantine	12
Bills of health issued	162
Mayaguez:	
Vessels inspected	63
Vessels held in quarantine	13
Vessels disinfected	2
Passengers inspected	4,528
Crew inspected	3,492
Bills of health issued	50
Fajardo:	
Vessels inspected	48
Passengers inspected	129
Crew inspected	312
Bills of health issued	49
Aguadilla:	
Vessels inspected	5
Passengers inspected	32
Crew inspected	186
Bills of health issued	18
Arecibo:	
Vessels inspected	17
Passengers inspected	222
Crews inspected	641
Bills of health issued	8
Arroyo:	
Bills of health issued	32
Humacao:	
Vessels inspected	20
Crew inspected	160
Bills of health issued	37
Guanica:	
Vessels inspected	2
Passengers inspected	1
Crew inspected	45
Bills of health issued	2

OPERATIONS OF THE SERVICE IN HAWAII.

The following transactions for the fiscal year ended June 30, 1911, are abstracted from the report of Passed Asst. Surg. Ramus, chief quarantine officer:

> The work of the service in Hawaii is divided into four heads: First, quarantine operations; second, plague-preventive measures; third, immigration inspection; fourth, marine-hospital relief. Only the quarantine operations and plague-preventive measures will be reported under this heading, the subjects of immigration and marine-hospital relief in Hawaii being treated of elsewhere in this report.

The United States Quarantine Laws and Regulations were enforced by officers of the service at Honolulu and six subports of entry in the Hawaiian Islands.

SUMMARY OF TRANSACTIONS.

Vessels inspected and passed	391
Vessels cleared	224
Passengers inspected	68,373
Crews inspected	48,364
Vessels disinfected	98
Persons detained in quarantine for observation	674
Persons disinfected and allowed to proceed to port of destination	1,011
Persons treated on island for quarantinable diseases	16
Persons treated for diseases other than quarantinable	41
Pieces of baggage disinfected	6,691
Persons detained on island for observation by board of health	1,461
Persons treated in quarantine hospital by board of health	85
Number of cremations (all but two for board of health)	52
Number of deaths	18
Number of births	2
Number of persons vaccinated	220
Number of hides disinfected	33,873

Operations at the subports in Hawaii.

	Hilo.	Mahukona.	Kahului.	Lahaina.	Koloa.	Port Allen.
Vessels inspected	67	25	17	33	21	11
Vessels cleared	98	....	....	....	....	....
Vessels disinfected	48	....	....	....	....	....
Baggage disinfected	1,500	....	....	....	....	....
Baggage inspected	650	....	....	....	....	....
Persons inspected	3,812	2,878	1,410	4,362	1,790	1,136
Hides disinfected	2,500	....	....	....	....	....

At Honolulu the service has a first-class quarantine and disinfecting station with a wharf capable of accommodating vessels of 35 feet draft. The quarantine station has accommodations for 75 cabin and 600 steerage passengers in the regular quarters and barracks. In addition there are tent platforms of United States Army Regulation, 14 by 15 size, which can be made available at short notice for 1,280 soldiers, with the cooperation of the Quartermaster Department of the Army or of the Hawaiian National Guard. There is also tentage capacity on the island for at least as many more troops or other persons.

At Hilo the service maintains a second-class quarantine and disinfecting station with facilities for fumigating vessels by the sulphur-pot method. There is as yet no provision for handling numbers of persons in quarantine except on shipboard or by arrangement with the board of health for use of its quarters temporarily.

On October 6, 1910, the chief quarantine officer and the president of the board of health visited Hilo and a number of sugar plantations along the Hamakua coast of the island of Hawaii. The rat campaign under the board of health was found in active and efficient operation all along the line.

At the subports of Mahukona, Kahului, Lahaina, Port Allen, and Koloa acting assistant surgeons of the service board and inspect incoming vessels.

Occurrence of quarantinable diseases.—With the exception of typhus fever all of the quarantinable diseases were met with in the Hawaiian Islands during the fiscal year.

Cholera.—There were two outbreaks of Asiatic cholera at Honolulu during the fiscal year. The first began on February 24, 1911, when two cases were discovered by the board of health physicians in the Kakaako district. Both were Hawaiians living in a miserable shack adjoining some large fresh-water fish and taro ponds. They died within 24 hours after the onset of the disease. Clinical signs and anatomical findings at autopsies were typical of cholera. Microscopical evidence confirmed these, and a positive diagnosis of cholera was announced by the board of health. During the next few days cases developed in different parts of the city, showing a wide distribution of the infection.

The service imposed outgoing quarantine restrictions as required by the revised quarantine regulations. These were enforced against all vessels sailing for the Pacific coast ports of the United States and vessels engaged in interisland traffic. The same restrictions were put on vessels departing for ports in British Columbia and for Mexican ports, with the consent of the agents. By their request the same measures were adopted with vessels bound for British colonial ports in the South Pacific.

The board of health prohibited fishing and bathing in the harbor and along adjacent shores. In carrying out this prohibition the cooperation of the service was requested and given, by having the boarding launch *Oahu* patrol the harbor and reef during the day when not engaged in boarding duty. The board of health employed another launch for night duty. Dr. Currie and Mr. Clegg, director and assistant director, respectively, of the United States Leprosy Investigation Station, were consulted by the president of the board of health, and at his request Mr. Clegg was detailed for three days to assist the board of health, authority having been cabled from the Bureau. In the course of his search for the source of the infection Mr. Clegg demonstrated cholera bacilli in water from the fish and taro ponds in Kewalo and in water from a bucket in a house in Manoa Valley, where a death from cholera had occurred.

It was feared that infection might be carried to the other islands by Japanese sampans. A large number of these peculiar boats are engaged in the fishing business. Some 60 or more have modern high-power gasoline engines and are able to go long distances at considerable speed. The suspicion that some of them are concerned in smuggling operations made it the more important that they be subjected to efficient quarantine supervision. Ordinarily sampans may enter and leave port without any official supervision. The resources of the service being already severely taxed, the cooperation of the United States revenue cutter *Thetis* was requested and obtained through the courtesy of her commander, Capt. C. S. Cochran. Thereafter all outwardbound sampans were required to report for inspection, day or night, alongside the *Thetis* before being allowed to leave the harbor. On one occasion a sampan attempted to elude the inspection, but was speedily brought back by a shot across her bows.

The local board of health handled the internal cholera situation with promptness and efficiency. Cases developed almost daily until March 14, when the last case of the first outbreak occurred. The total number of cases was 31, with 22 deaths.

The distributing source of the infection was traced circumstantially by Dr. Currie to poi, a native food. He was led to his conclusion by the fact that, with two doubtful exceptions, the victims were native Hawaiians. The ultimate source of the infection is unknown, but in the present state of medical science the conclusion is inevitable that it was brought to Hawaii by an oriental cholera carrier from either the Philippines, Russia, China, or Japan. The presumption inclines toward the Philippines, because the number of Filipinos coming to Hawaii during the previous year as compared to the total number of all other arriving aliens during the same time was about as 3 to 2.

On March 30 all outgoing quarantine restrictions were removed by bureau authority.

The second cholera outbreak began on April 12, 1911, and terminated April 25. The total number of cases was 8, with 7 deaths. Outgoing quarantine regultions were enforced during this period. At the request of the president of the board of health Dr. Currie, Mr. Clegg, and the entire force of the United States leprosy investigation station were detailed by the bureau to assist the board of health in studying and combating the cholera infection. This time the evidence pointed still more strongly to the native food poi as the secondary or distributing medium of the infection.

On May 8, 1911, outgoing quarantine restrictions on interisland traffic were removed by bureau authority.

On May 15, 1911, outgoing quarantine restrictions on traffic to the Pacific coast were removed by bureau authority.

The bodies of all cholera victims and of many that appeared suspicious at autopsy were cremated at the United States quarantine station.

Plague.—During the fiscal year plague occurred at the ports of Honolulu and Honokaa.

At Honolulu there were two deaths, on July 6 and 8, respectively. Both had been diagnosed pneumonia, but when the bodies were examined by physicians of the board of health they were found to be suspicious. Specimens were referred to this laboratory and positive diagnoses of plague were made on July 22. One case was purely pneumonic. The other was mixed pneumonic and glandular. The premises were disinfected and renovated by the board of health. No instances of rat infection were found in connection with these cases.

At Honokaa, Hawaii, plague occurred several times. On December 19, 1910, a Filipino infant died of bubonic plague. Under the floor of a stable nearby were found one dead rat and three dead mice. The rat and two of the mice were plague infected.

On January 26, 1911, there were two deaths. Both were Hawaiians, a man and an infant.

On April 19, 1911, there was a death from plague.

On April 28, 1911, a dead rat was found which was later shown to have died of plague.

Since plague first appeared at Honokaa during the previous fiscal year, the board of health has kept up a vigorous rat campaign.

The last reports show that Honokaa and its immediate neighborhood are now nearly free of rats and mice.

Specimens from Honokaa cases, human and rat, are always referred to the United States plague laboratory for final pronouncement.

Yellow fever.—On Sunday, October 30, 1910, there occurred the most important quarantine event in the history of Hawaii. The Japanese steamship *Hong Kong Maru* arrived direct from Manzanillo, Mexico, with a case of yellow fever aboard. The patient was a Japanese steerage passenger who had been working some time at Empalme, Sonora, Mexico. He was in Manzanillo two days before embarking. He became sick nine days out from Manzanillo. On arrival at Honolulu the case was in the third day of the disease. The vessel was held outside the harbor, anchored about 1 mile from the shore, thoroughly fumigated, and released after seven days' detention. The vessel had been fumigated at Salina Cruz prior to departure, but not at Manzanillo. At the latter port she lay one-fourth mile from shore, according to the bill of health. The coincidence of this case on the *Hong Kong Maru* with the death at sea of probable yellow fever on the British steamship *Henley*, leaving Salina Cruz about the same time, is regarded as most important.

Smallpox.—Smallpox was encountered on five arriving vessels and occurred locally at Honolulu and several places on the island of Hawaii and Maui. At Honolulu one well-marked case occurred May 4, 1911. The patient was a Porto Rican, with a wife and four small children. He had been vaccinated 27 years ago, but the children never. All four children showed signs and gave histories of recent smallpox, one after another, during the previous two months. The wife had been recently vaccinated and remained well.

At Punnene, Maui, the largest number of cases occurred. All were Filipinos. Cases developed in the board of health quarantine camp from December 24 to January 23, 1911, 40 cases in all, but with a reasonable certainty that there were several earlier cases undetected. The outbreak was mild in character, with no deaths. A case of smallpox in a Filipino occurred at Wailuku, Maui, on January 29, 1911.

The source of the smallpox infection has not been positively determined, but it seems probable that it was brought to Hawaii in the baggage of certain Filipino immigrants.

On the island of Hawaii smallpox occurred at Hilo, Olaa, Waiakea, and Kona. The Hilo case was found September 8, 1910, on the steamship *Wilhelmina* from San Francisco via Honolulu. One case was reported at Hookena, Kona, on March 22. A case occurred at Waiakea, near Hilo, on March 25. One case occurred at Olaa on May 4, 1911.

Leprosy.—Leprosy is endemic in the islands. Seventy-nine cases were apprehended during the year. One case was encountered November 9, 1910, on the steamship *Mongolia*, from San Francisco. It was delivered into the custody of the board of health.

Vessels inspected.—Five hundred and sixty-five vessels were boarded and inspected by service officers upon arrival at ports of entry in the Hawaiian Islands during the fiscal year, namely: Honolulu, 391; Hilo, 67; Mahukona, 25; Lahaina, 33; Kahului, 17; Koloa, 21; Port Allen, 11.

Vessels cleared.—In consequence of the outgoing quarantine restrictions in force at the ports of Honolulu and Hilo during the fiscal year 224 vessels were inspected and cleared at Honolulu and 98 at Hilo.

Vessels disinfected.—Ninety-eight vessels were disinfected at Honolulu and 48 at Hilo during the fiscal year. At Honolulu 10 were on account of incoming and 88 of outgoing quarantine. At Hilo one was on account of incoming and 47 of outgoing quarantine.

Vessels infected.—During the fiscal year 14 vessels arrived at Honolulu which were actually infected, presumably infected, or had recently been infected with quarantinable disease. The following is a chronological abstract:

Outgoing quarantine.—During the fiscal year plague, cholera, and smallpox were present in Honolulu. Following the occurrence of two cases of plague, on July 6 and 8, respectively, agents and masters were notified that vessels bound for the Pacific coast would be required to observe rat precautions while at Honolulu or to be fumigated just prior to departure. All vessels engaged exclusively in interisland traffic were required to be fumigated at frequent intervals, from one to three months, depending on the vessel, cargo, and ports of traffic. No personnel quarantine was deemed necessary.

The first instructions to vessels were to breast off at least 6 feet and to wear rat guards on all lines, tar to be on the lines on the shore side of the guards. Later on it was found possible to modify these requirements somewhat. Large steamers with high sides were allowed to dispense with breasting off, the guarded lines being deemed sufficient protection against rats. Sailing vessels which lay for some days at wharves were not thought adequately protected even by breasting off and rat guards combined. Therefore they were required to be fumigated prior to sailing. At first this was done at the city wharves, for convenience of masters, but later on has been done altogether at the United States quarantine wharf.

In consequence to the outbreak of Asiatic cholera on February 24, 1911, special outgoing quarantine restrictions were imposed, in strict accordance with the revised United States Quarantine Regulations. All freight shipments were viséed in this office to exclude fruits, vegetables, and other materials capable of conveying infection.

Pursers of vessels were required to submit lists of supplies desired for the table to an officer of this service. Artesian water having been supplied to the entire water front, there was no difficulty from this source. Cabin passengers were required to furnish affidavits as to their places of residence during the five days prior to sailing. Steerage passengers, except from other islands direct, were detained for five days at the United States quarantine station. Vessels departing for the Pacific coast were inspected and cleared by a service officer.

Interisland vessels were not inspected at departure from Honolulu, but on arrival at island ports of destination.

Japanese sampans leaving the harbor were inspected at the request of the chief quarantine officer by officers of the United States revenue cutter *Thetis.*

Outgoing quarantine restrictions on account of cholera were terminated March 30 by bureau authority.

On April 12 a second outbreak of cholera began and outgoing quarantine was again put on.

This was terminated as to interisland traffic on May 8 by bureau authority, and as to Pacific coast traffic on May 15, 1911, by the same authority.

Hilo, Hawaii, having been plague infected several times during the past few years, though not actually so in the fiscal year ending June 30, 1911, outgoing rat precautions have been in force there for some time, similar to those now in force at Honolulu. These apply also to interisland vessels making Hilo their home port.

Hides, wool, and certain other animal substances coming from plague-infected or suspected districts are required to be disinfected prior to shipment for the mainland.

Rags and other junk coming from insanitary districts, or that might have been in contact with lepers, are not allowed to be shipped.

In the outgoing quarantine operations at Honolulu 88 vessels were disinfected during the fiscal year; at Hilo 47 vessels were disinfected.

On April 18, 1910, during the previous fiscal year, cablegram instructions were received from the bureau to fumigate vessels bound for Mexican ports. These instructions were carried out until October 19, 1910, when they were discontinued by bureau authority.

ASSISTANCE TO OTHER SERVICES.

1. *United States Army.*—The United States army transport *Sheridan* arrived November 11, 1910, with smallpox aboard. At the request of the depot quartermaster permission was given for the troops who had presumably been exposed to smallpox to serve out their quarantine at Schofield Barracks, under the charge of an Army medical officer instead of at the United States quarantine station. The railway cars used by the troops were disinfected by this service. Our action in this matter was considered a great accommodation to the United States Army.

2. *United States Navy.*—At various times enlisted men of the United States Navy, sick of communicable but not quarantinable diseases have been cared for at the United States quarantine station at the request of the commandant of the United States naval station. Actual expenses are borne by the Navy Department.

3. *United States Revenue-Cutter Service.*—Two hundred and twenty-two seamen were treated at the out-patient office and 23 in hospital. Sixty physical examinations were made of candidates for enlistment. A medical officer of this service was detailed, by bureau authority, to accompany the U. S. S. *Thetis* on her periodical cruises. One revenue-cutter officer was physically examined for promotion by a board of medical officers of this station.

4. *British Navy.*—On June 26, 1911, H. B. M. flagship *Kent* arrived from Acapulco, Salina Cruz, Panama, and various South

American ports. The time was later than the usual boarding hour, but the vessel was immediately boarded by the chief quarantine officer and an officer of the United States naval station. When it was found that Dr. Rodd, the fleet surgeon, had caused the *Kent* to lie offshore at least half a mile from every Mexican or South American port where a stop had been made, and that there had been no sickness since leaving Acapulco, pratique was immediately granted and the usual quarantine formalities were completed while the *Kent* approached the United States naval station.

On June 28 H. B. M. S. *Challenger*, of the same fleet, arrived. Her itinerary and shore distances had been the same as with the flagship *Kent*. A case of measles was present in the crew, and there had been several cases during the voyage. At the request of the commanding officer the *Challenger* was taken first to the United States quarantine wharf and disinfected to the extent desired by her medical officer. The fleet commander and fleet surgeon expressed great appreciation for the courtesies extended to the British Navy by this service.

Inasmuch as this report was not completed until July 24, 1911, brief mention may here be made of several historic occurrences during the stay of the British fleet at Honolulu. At noon on July 4, 1911, the United States flag was saluted by the guns of the British armored cruisers *Kent* and *Challenger*. This is the first time since 1812 that this salute has been made by a British man-of-war. On Sunday evening, July 2, 1911, a great public mass meeting was held in the Honolulu Opera House for the purpose of considering the arbitration treaty then pending between the United States and Great Britain. There were no services in the churches, so that all might attend the mass meeting. The sentiment of the great audience was unanimous for unlimited arbitration. Shortly afterwards a company of men from the British fleet and from the United States naval station exchanged uniforms and marched together singing British and American patriotic songs.

In view of the international character of events at Honolulu following the arrival of the British cruisers *Kent* and *Challenger*, it is regarded as a matter for congratulation that it became the privilege of this service to extend the first courtesies to those historic vessels.

5. *Department of Justice.*—When the United States revenue cutter *Thetis* returned from Laysan Island with a number of Japanese poachers as prisoners, the United States quarantine launch *Oahu* was used for the transfer of the prisoners to the wharf, where they were taken charge of by the United States marshal.

Physical examinations of Federal prisoners are made by officers of this service when so requested by the United States district attorney.

On several important occasions in the interest of justice the United States marshal, or his deputies, have been taken in the boarding launch to arriving steamers.

On one occasion when the United States district attorney wished to ascertain if certain criminals were aboard a steamer arriving from the Orient, but did not wish to excite suspicion or comment by the presence of a man from his or the marshal's office, he made the request that the quarantine officer who boarded the steamer would endeavor to find if the men were aboard by description which he furnished. Dr. Marshal volunteered and succeeded in identifying the persons wanted. We were pleased to be of assistance to the Department of Justice, as this service is indebted to district attorney Robert W. Breckons and Marshal E. R. Hendry for many courtesies.

6. *Customs service.*—During the latter half of the fiscal year there has been a great increase in the smuggling of opium into this port. When outgoing quarantine restrictions were in force on account of cholera being in port the work of the customs inspectors was sometimes interfered with by the men employed as guards while steamers bound for the coast were in port. At the request of the collector of customs, and with the advice of the United States district attorney, United States customs officers were detailed to enforce the quarantine regulations in addition to their usual duties on steamers in port. This cooperation facilitated the work of the customs service by enabling its inspectors to keep tab on all persons leaving and boarding steamers suspected of carrying smuggled opium, but also operated to the advantage of this service by having more responsible and trustworthy men acting as guards.

7. *Immigration service.*—In addition to the routine examination of arriving aliens at the United States immigration station first and second cabin passengers are examined on board steamers when so requested by the immigration officer. Cases under treatment at the Japanese hospital are visited there by an officer of this service when requested by the inspector in charge. Chinese residents of Hawaii when departing on long visits to China are examined to determine whether they have trachoma when leaving Hawaii. This is done once every week at the request of the inspector in charge, prior to sailing of steamers for the Orient.

8. *Board of health.*—The United States plague laboratory examines all rats and mongoose caught in Honolulu. The number of rats examined during the fiscal year was 36,243. On December 27, 1910, the service was requested to fumigate all vessels suspected of carrying anopheles mosquitoes. In compliance with this request the Steamship *Hong Kong Maru*, from Manzanillo, was fumigated on April 25, 1911, and the Steamship *Kiyo Maru*, from the same port, on June 23, 1911. Two cabin passengers from the Steamship *Sierra* having diphtheria were taken to the United States quarantine station December 30, 1910, and treated there until recovered. On April 13, 1911, the British Steamship *Orteric* was disinfected, and 1,490 immigrants received at the United States quarantine station on account of scarlet fever. Fifty cremations were performed during the year, including 29 victims of Asiatic cholera. During the first cholera outbreak the service launch *Oahu* assisted the board of health by patroling the harbor and reef when not engaged in boarding duty. Japanese sampans leaving the harbor were overhauled and inspected by the U. S. S. *Thetis*, in cooperation with this service. The United States leprosy investigation station, of this service, assisted the board of health very materially by tracing the secondary or distributing source of the cholera infection.

9. *Associated charities.*—When not conflicting with his regular duty an officer of this service, accompanied by a district nurse, occasionally visits, examines, advises, and prescribes for indigent Hawaiians having tuberculosis or suspected of such infection.

Personnel.—At the close of the fiscal year the roster of officers of the service on duty in the Hawaiian Islands under the quarantine office was as follows:

Honolulu: Carl Ramus, passed assistant surgeon, chief quarantine officer; Edward R. Marshall, assistant surgeon, executive officer; Julian M. Gillespie, assistant surgeon; A. N. Sinclair, acting assistant surgeon; William F. James, acting assistant surgeon; Irwin J. Shepherd, acting assistant surgeon; Frank A. Stump, pharmacist; Emma F. Smith, medical inspectress.

Hilo: Leo L. Sexton, acting assistant surgeon.

Mahukona: B. D. Bond, acting assistant surgeon.

Lahaina: Franklin Burt, acting assistant surgeon.

Kahului: William F. Osmers, acting assistant surgeon.

Koloa: Thos. J. West, acting assistant surgeon.

Port Allen: A. H. Waterhouse, acting assistant surgeon.

Changes.—Dr. L. L. Sexton was appointed acting assistant surgeon for duty at Honolulu July 6, 1910, vice Dr. George Harker, resigned. On November 1, 1910, Dr. Sexton was transferred to Hilo for duty, vice Dr. John J. Grace, resigned.

Asst. Surg. Julian M. Gillespie reported for duty at Honolulu July 6, 1910. In addition to the duties assigned him by the chief quarantine officer the latter was directed by the bureau to detail Dr. Gillespie as medical officer of the United States revenue cutter *Thetis* on her periodical cruises when so requested by the commanding officer of that vessel. During the fiscal year Dr. Gillespie accompanied the *Thetis* on several cruises among the islands, and on June 20, 1911, departed with the *Thetis* on an Arctic cruise.

Pharmacist Julius E. Beck was relieved from duty at Honolulu by orders reaching him August 23, 1910, directing him to proceed to Savannah, Ga.

PLAGUE LABORATORY.

The work done in this laboratory during the fiscal year is considerably more than during the previous year, as is shown in the statistical tables at the end of this report. No plague-infected rats were found this year at Honolulu or on the island of Oahu. At Honokaa, Hawaii, plague, rat and human, occurred several times, and specimens and cultures were always referred to this laboratory for final diagnosis.

No original work was done this year owing to lack of time and shortage of officers. During the two cholera outbreaks peptone culture media was furnished to the board of health. Assistance to the board of health and to local physicians was frequently given by Dr. Marshall in the examination of sputum, Widal tests for typhoid fever, and histological diagnosis of tumors.

Besides the medical officer in immediate charge of the plague laboratory the force consists of three trained attendants.

Card system.—The card system for recording autopsies, as used in the Federal plague laboratory at San Francisco by Passed Asst. Surg. George W. McCoy, has been adopted for recording all inoculations of rodents, and has been found simple, efficient, and timesaving when such records were needed for reference. This system was introduced by Asst. Surg. Edward R. Marshall when he was detailed in charge of the plague laboratory.

Transactions of plague laboratory.

Total rats and mongoose taken	38,103
Rats trapped	36,243
Mongoose trapped	676
Rats found dead	26
Rats shot from trees	945
Rats killed by sulphur dioxide	213
Examined bacteriologically	33,006
Classification of rats trapped:	
Mus alexandrinus	4,449
Mus musculus	12,577
Mus norvegicus	3,492
Mus rattus	15,710
Classification of rats shot from trees:	
Mus alexandrinus	285
Mus norvegicus	48
Mus rattus	498
Classification of rats killed by sulphur dioxide:	
Mus alexandrinus	96
Mus musculus	1
Mus rattus	116
Classification of rats found dead:	
Mus alexandrinus	3
Mus musculus	4
Mus norvegicus	7
Mus rattus	12
Total number of rat trappers	12
Number of traps set daily	1,720
Total number inoculations made on guinea pigs and mongoose	26
Number of human cases proven to be pest infection	2

Hilo.

Number of Hilo rats referred to this laboratory for bacteriological diagnosis	10
Number of Hilo human cases referred to this laboratory for bacteriological diagnosis	4
Number of Hilo rats proven to be pest infection	4
Number of Hilo human cases proven to be pest infection	4
Total inoculations made on guinea pigs	17

FOREIGN QUARANTINE.

The duties of officers of the Public Health and Marine-Hospital Service detailed at foreign ports are as follows:

First. The investigation into the previous whereabouts and the past and present sanitary history of all vessels destined for ports in the United States, its possessions, and dependencies.

Second. The inpection of vessels, crews, and passengers, and the certification of freight.

Third. The fumigation of ships to kill rats and mosquitoes, or the disinfection of ships when necessary.

Fourth. The observation, if necessary, under detention, of intending passengers for ports in the United States and its dependencies.

Fifth. Weekly reports of transactions.

Sixth. Weekly reports as to the health and sanitary conditions of the foreign port, and when possible of the country contiguous thereto.

Seventh. The certification, in conjunction with the United States consular officers, of the bills of health issued, said certificates to be made just prior to the departure of the ship and to cover all requirements provided for by the United States quarantine regulations.

FRUIT PORT INSPECTION SERVICE.

Acting assistant surgeons were detailed in accordance with custom to enforce at certain foreign fruit ports the quarantine regulations relating to fruit vessels, which permit the entry of such vessels to ports in the United States without detention at quarantine stations.

The reports from the officers at the several stations follow:

BOCAS DEL TORO, PANAMA.

Acting Asst. Surg. Paul Osterhout reports as follows:

Season of 1910 (July 1 to Oct. 31). Ninety-eight vessels, with 4,989 crew and 2,623 passengers, were inspected.

The health conditions of the port and of the surrounding territory have been good during the year.

During the season of 1911 this station was closed.

BLUEFIELDS, NICARAGUA.

Acting Asst. Surg. Allen Jumel, jr., reports as follows:

Season of 1910 (July 1 to Oct. 31). Thirty-six vessels, with 58 passengers and 1,283 crew, were inspected and passed.

The health conditions of the port have been good throughout the year.

During the season of 1911 this station was closed.

CEIBA, HONDURAS.

Acting Asst. Surg. T. B. L. Layton reports as follows:

Season of 1910 (July 1 to Oct. 31). Eighty-seven vessels, with 1,797 crew and 182 passengers, were inspected.

The health conditions in the port during the year were reported to be fair, although none of the quarantinable diseases were observed.

During the season of 1911 this station was closed.

LIVINGSTON AND PUERTO BARRIOS, GUATEMALA.

Acting Asst. Surg. R. P. Ames reports as follows:

Season of 1910 (July 1 to Oct. 31). Seventy-two vessels, with 2,794 crew and 245 passengers, were inspected.

No quarantinable diseases were reported during this period.

Acting Asst. Surg. Allen Jumel reports as follows:

Season of 1911 (months of May and June). Thirty-four steamers, carrying 2,560 passengers and crew.

All consular bills of health are signed by the American consular officer at Livingston, sent to Barrios, countersigned by the representative of the Public Health and Marine-Hospital Service, filled out and issued by him at the time of inspection and clearance. Pertinent and necessary remarks concerning the local and adjacent health and sanitary conditions, as well as the sanitary condition of vessel and health conditions of passengers and crew, are entered as an essential and component part of all bills of health issued.

Large fruit steamers, plying between New Orleans, Barrios, Limon, and Colon, anchor in open bay, about 1 mile from shore, and, as a rule, remain in port only long enough to disembark passengers and freight and embark passengers for Limon, Colon, and points via Colon in Europe. All other steamers, large and small, load and unload alongside the pier at a point ranging from 100 to 200 yards from the shore. The matter of vessel anchorage and mooring alongside the pier is entirely discretionary with the various transportation companies.

All vessels inspected and cleared are examined with a view toward determining the presence of stegomyia calopus mosquitoes. None observed on board any vessel inspected.

No vessels disinfected during the fractional year.

The smallpox situation has cleared up considerably, there being no new cases reported from Quiragua, and very few reported as being present on the lake shore, about 60 miles inland from the port of Livingston. The Guatemalan officials have taken the usual precautions to prevent spread of infection. Practically all persons in Barrios and Livingston have been vaccinated, while vaccination has been extensively employed in the infected districts. The spread of this disease has been checked, and from present indications the disease will have been eradicated in the course of the next five or six months. In this connection it is interesting to report that the vaccine employed in the Republic is made in the city of Guatemala, at the Institucion de Vacuna.

Local sanitary conditions are the same as they have been in former years. Surface pools are numerous in the rainy season, while the drainage of the port is effected by surface drains, kept serviceable with difficulty. Mosquitoes are numerous. Both the anopheles and Stegomyia calopus are present in abundance.

All passengers who reside in and around Barrios are required to undergo a three-day period of observation before certification. Passengers from the interior and from points in the neighboring republics on the Pacific side are required to undergo a three-day period of observation in the city of Guatemala, and bring to the office of the United States Public Health and Marine-Hospital officer a certificate to that effect. Additionally, the certificate shows that the holder thereof has been in good health during his observation period, and bears his description, age, etc. These certificates are issued by a reliable physician regularly appointed by the various transportation companies.

The health and sanitary conditions of all vessels inspected and cleared has been good. Occasionally cases of malarial fever are observed, but no serious case of any disease has been observed on any vessel during the fractional year.

Inspection of baggage no longer required and none effected during the year.

PORT LIMON, COSTA RICA.

Acting Asst. Surg. C. L. Mengis reports as follows:

Season of 1910 (July 1 to Oct. 31). One hundred and nineteen vessels, with 3,251 crew and 1,530 passengers, were inspected. Fifty-one vessels were fumigated.

The infection with yellow fever of the Atlantic Zone of Costa Rica (see annual report 1910, p. 132) was eradicated in the early part of August of 1910, the last case of the disease occurring at Siquirres on July 31. During this outbreak there were 25 cases, with 11 deaths.

At the request of the Government of Costa Rica, the work of sanitation in all the infected foci was done under the supervision of the service representative stationed in the office of the American consul at Port Limon. All the houses in Siquirres and along the railway to "28 miles," a distance of 10 miles, were fumigated, and the breeding places of mosquitoes were destroyed. Similar work was carried out in Matina, Estrada, Punta Arenas, Heredia, Alajuela, and other towns on the Pacific coast.

This work was also extended to Port Limon itself, where it was carried out by Dr. Benjamin Cespedes, the Jefe de Sanidad of the Limon province.

The quarantine regulations as applied to infected ports were enforced in connection with the shipping from Port Limon between July 1 and October 19, 1910.

Season of 1911 (May 1 to June 30). Forty-four steamers were inspected and passed, and one steamer was fumigated. Seventeen hundred and sixty passengers and crew were inspected, and of this number the temperature was taken of 203 passengers and 1,113 crew.

The sanitary conditions in Limon were very good. The only possible breeding places for the Stegomyia calopus are the gutters on the houses, which the sanitary officer of Limon is trying to have removed. The laws relating to the screening of water receptacles is enforced and the streets are kept free from refuse.

The district beginning at the Estrados and ending at Siquirres, while not as bad as in 1910, is yet far from being in a good sanitary condition. The larger water receptacles are screened, but no attention is paid to tins, cans, and other vessels holding water.

At San Jose an amount of money has been set aside for the destroying of the breeding places of mosquitoes.

The Government of Costa Rica maintains a maritime quarantine at Limon and Punta Arenas against all places supposed to be infected with bubonic plague, yellow fever, cholera, and smallpox. All persons coming into the country are required to be vaccinated.

Passengers from Costa Rica going to Panama must either obtain a certificate from the American consul at San Jose showing on their part a five-day residence in a high altitude or else go into quarantine at Colon. Those passengers destined for the southern United States must either report to the American consul at San Jose or the acting assistant surgeon at Limon for three days prior to embarkation.

At Port Limon no shore communication is allowed vessels destined for southern ports except that which is necessary for business. As yet no illness has developed among the ships' crews, and the personnel remains practically the same throughout the year. At Port Limon the two piers extending quite a distance into the bay are within the flight of a mosquito under ordinary conditions.

PUERTO CORTEZ, HONDURAS.

Acting Asst. Surg. Le Roy Stowe reports as follows:

Season of 1910 (July 1 to Oct. 31). Seventy-three vessels, with 1,823 crew and 344 passengers, were inspected.

No quarantinable diseases were reported during this period.

Season of 1911 (May 1 to June 30). Forty-seven vessels, carrying 1,391 passengers and crew, were inspected. No quarantinable diseases were reported.

TELA, HONDURAS.

Acting Asst. Surg. C. K. Roe reports as follows:

Season of 1910 (July 1 to Oct. 31). Nineteen vessels, with 258 crew and 5 passengers, were inspected. The health of the port during this period was good.

This station was closed during the season of 1911.

INSPECTION AT OTHER FOREIGN PORTS.

In addition to the medical officers detailed to the several fruit ports above mentioned, officers were also detailed to the offices of United States consuls, in accordance with the act of Congress approved February 15, 1893, at the following ports for the purpose of enforcing the Treasury regulations provided for such ports and signing the bills of health in conjunction with the consuls.

At certain of the ports, viz, Bridgetown, Castries, Trinidad, and La Guaira, officers were detailed not only to certify as to the health conditions of vessels leaving these ports for the United States, but also to perform the necessary disinfection of said vessels when their original port of departure was an infected or suspected port. By fumigating these vessels, either for the destruction of mosquitoes or rats, and giving a certificate with regard to such disinfection, the time consumed by the passage of the vessel from the above-named ports to the quarantine stations in the United States was accredited to the vessel as a deduction from the time which might otherwise be demanded for detention at the United States quarantine station.

At a number of the other ports named below, particularly those in Italy, the officers, in addition to their quarantine inspection, made inspection of immigrants with reference to contagious or infectious diseases which might debar them from admission on arrival in the United States. These inspections were made in accordance with requests from the Immigration Service and the steamship companies, the officers exercising no positive right of exclusion, but informing the steamship companies and others of those who would be subject to rejection at the port of arrival under the Immigration Regulations.

Following are extracts from the reports made to the bureau by the officers stationed at the ports named:

HABANA, CUBA.

The following is an extract from the report of Acting Asst. Surg. P. Villoldo for the fiscal year ending June 30, 1911:

Cuba has been free from yellow fever throughout the past year. As usual, all cases of fever in nonimmunes have been examined by the commission for the diagnosis of infectious diseases, 317 of such cases having been passed upon by this body during the period.

Operations of the service.

Bills of health issued	1,144
Vessels inspected and passed	816
Members of crews of outgoing vessels inspected	46,921
Passengers of outgoing vessels inspected	37,802
Vaccination certificates issued	135
Certificates of immunity to yellow fever issued	10

The examination of passengers and crews of vessels bound for the United States has been conducted with the usual care, and whenever a case of abnormal temperature was found which could not be satisfactorily explained, in the case of passengers they have been advised to postpone their trip, and in the case of members of crews they have been sent to Las Animas Hospital for observation.

Medical and minor surgical treatment has been furnished to 37 seamen, divided as follows: Eight cases from the party working on the wreck of the U. S. S. *Maine*, 3 from United States Navy auxiliary *Leonidas*, and 26 sailors from merchant vessels of the United States.

MATANZAS, CUBA.

Acting Asst. Surg. E. F. Nunez reports as follows:

No case of quarantinable disease, excepting leprosy, has been reported either originating in or imported into Matanzas during the year.

A careful inspection has been made of outgoing vessels, cargoes, crews, and passengers destined for United States ports, more especially when originating from or touching at infected ports, prior to the granting of bills of health.

It was not necessary to fumigate or disinfect any vessel arriving in Matanzas from an infected port during the year, because fumigation had previously been performed at other ports, either by an officer of the service or some physician duly authorized by the American consular officer at the port of departure or at intermediate ports.

On November 8, 1910, in view of the possibility of passengers from plague-infected countries in South America and the West Indies arriving in Cuba by way of Jamaica during the incubation period of plague, the Cuban consular officers in Jamaica were directed to hold passengers under observation for 10 days and provide them with certificates prior to their departure for Cuba.

The usual quarantine as in former years has been enforced against Central and South American ports (the Canal Zone and the Republic of Panama excepted). Another exception has lately been made of vessels and passengers originating from Colombia and Costa Rica via the Canal Zone, provided such vessels and passengers have complied with the United States quarantine regulations at the ports in the countries named, and have proceeded to Cuba direct and furnished on arrival a proper certificate issued by a service officer or else by the Cuban consul.

The cooperation of service officer at Matanzas has been requested by the local commission of infectious diseases to determine the diagnosis of every reported case suspicious of yellow fever.

Summary of transactions.—During the fiscal year 128 steamships and 14 sailing vessels bound for the United States, making a total of 242, were inspected and granted bills of health. These vessels carried an aggregate number of 5,538 members of crew, and 332 passengers; the latter were mostly immigrants, originally from Spain, destined for various ports in Cuba, a small number being bound for New Orleans. There were also two American stowaways bound from Antilla, Cuba, to New York via Matanzas.

The official records of births and deaths in the city of Matanzas for the three calendar years ended December 31, 1910, show the following items:

Years.	Births.	Deaths.
1908	1,255	491
1909	1,881	676
1910	1,468	635
Total	4,104	1,802

SANTIAGO DE CUBA.

Acting Asst. Surg. Richard Wilson, on duty at this port reports in part as follows for the fiscal year 1911:

Summary of transactions.—Bills of health were issued to 328 vessels bound for the United States and its dependencies. This is an increase of 34 over the last fiscal year. The largest number of bills of health issued in one month was 39, in March, 1911, followed by 34 in May and 32 in April. The smallest number of bills of health issued in one month was 22, in August, 1910, followed by 23 in February, 1911; all of the other months had 24 or more. The second semester of 1910–11 shows a decided increase, this being due in part to the new line established by the Hamburg-American Steamship Co.

Of the 328 vessels to which bills of health were issued 45 were inspected before leaving. It was not thought necessary to inspect more because the whole island has been free from quarantinable diseases for more than a year.

During the fiscal year only one vessel was disinfected, on August 27, 1910, at the request of the steamer's agent. No vaccination certificates were issued for the Canal Zone and Panama. Only three immune certificates were issued.

Leprosy.—The only quarantinable disease reported during the year has been leprosy, of which there are now nine cases under observation.

Transmissible diseases.—The only epidemic reported has been that of measles which has lasted six months, but it has not been so bad as the previous epidemic three or four years ago.

Of the other transmissible diseases there have been a few cases of scarlet fever, diphtheria, and varicella. Vaccination has been practiced systematically in the city.

In February, 1911, it was reported that there was smallpox at Omaja, in the Province, about 100 miles from Santiago, on the Cuba Railroad. On investigation it proved to be varicella.

SALINA CRUZ, MEXICO.

Acting Asst. Surg. Alfredo E. Gochicoa reports as follows:

For the fiscal year ended June 30, 1911, 76 vessels, 68 steamers and 8 sailing vessels, bound for ports in the United States and its insular possessions, were inspected, of which number 65 were fumigated. These vessels carried a total of 535 passengers and 3,238 crew. The fumigation of vessels leaving Salina Cruz for ports in Hawaii is regularly performed for the destruction of mosquitoes.

No yellow fever has been reported in Salina Cruz since 1905. The general health conditions during the period have been reported good.

PUERTO MEXICO (COATZACOALCOS), MEXICO.

Acting Asst. Surg. W. R. P. Thompson reports as follows:

During the fiscal year ended June 30, 1911, 208 vessels were inspected and 33 fumigated. The general health of the port during this period was good, the prevailing diseases being malaria and intestinal disorders.

PROGRESO, MEXICO.

Acting Asst. Surg. J. F. Harrison reports as follows:

Season of 1910 (July 1 to Oct. 31). Fifty steamers and one sailing vessel were inspected, together with 2,713 crew and 317 passengers. Twenty-six vessels were fumigated. There were no quarantinable diseases reported at Progreso during the year, but on October 1 a report was received of the occurrence of several cases with two deaths from yellow fever at Campeche. This report was never positively confirmed, but the local sanitary authorities at Progreso and Merida enforced quarantine restrictions upon land and sea traffic from Campeche, and the bureau sent timely notification to all of the quarantine stations concerned to observe special care in the inspection of all vessels from the Yucatan ports, and to enforce the quarantine regulations according to the conditions presented by the individual vessel and its personnel.

BRIDGETOWN, BARBADOS.

Acting Asst. Surg. P. G. Smith reports as follows:

July 1, 1910, to October 31, 1910, 125 vessels were inspected and passed, 38 of which were fumigated. The above vessels carried 2,354 persons as passengers, and 6,616 persons comprised their crews.

From May 1, 1911, to June 30, 1911, 61 vessels were inspected, passed, and their bills of health signed; 13 of these vessels were fumigated. These vessels carried 1,946 persons as passengers, and 2,947 persons comprising their crews, all of whom were inspected.

Summary for the year.

Number of vessels inspected and bills of health signed	186
Number vessels fumigated	51
Number passengers inspected	4,300
Number crews inspected	9,563

The health and sanitary condition of the port was good. Two cases of yellow fever occurred, one during the month of May, 1911, and the other during the month of June, 1911; both cases were promptly diagnosed and isolated, and rigid quarantine precautions were established by the colonial health authorities, with the result that there has been no further spread of the disease. Tuberculosis was quite prevalent, while pellagra and leprosy were among the other diseases observed.

CASTRIES, ST. LUCIA.

Acting Asst. Surg. A. G. Maylie reports as follows:

Season of 1910 (July 1 to Oct. 31). One hundred and twenty-six vessels, with 3,817 crew and 69 passengers, were inspected. Eighty-eight vessels were fumigated. The health conditions of this port were good during this period.

LA GUAIRA, VENEZUELA.

The following is abstracted from the report of Acting Asst. Surg. W. J. S. Stewart:

During the fiscal year 235 vessels, carrying 6,044 passengers and crews, were inspected and 15 vessels were fumigated. Of this number 37 vessels were inspected for Porto Rican and Panama ports.

Yellow fever.—During the fiscal year yellow fever occurred in La Guaira, as follows: One case with death on July 30, 1910; two cases with one death on November 30, 1910; one case with death on January 11, 1911.

In Caracas no yellow fever was reported during the fiscal year, but unofficial reports were received of the presence of this disease during the months of July, August, and September of 1911.

Plague.—No cases of plague were reported in La Guaira or in Puerto Cabello during the fiscal year 1911, but in Caracas this disease was reported as follows:

Date.	Cases.	Deaths.	Date.	Cases.	Deaths.
1910.			1911.		
July 10	2	1	Apr. 6	1	
July 25	4		Apr. 16	1	
July 30	1	1	Apr. 19	1	1
Aug. 13	1	1	May 19	1	
			May 24	1	
			June 10	1	

Dr. Stewart has been informed that yellow fever is virtually endemic in Valencia and La Victoria, and that very active epidemics of variola have also occurred in these places.

CALLAO, PERU.

Acting Asst. Surg. J. L. Castro-Gutierrez reports from Callao, Peru, for the fiscal year ended June 30, 1911, as follows:

During the fiscal year 150 vessels were dispatched, of which 141 were fumigated before sailing and 9 inspected and passed. Eleven thousand five hundred and forty-one members of crews of the vessels, 4,583 cabin and 2,135 steerage passengers were inspected. Vaccination was performed upon 629 persons coming from localities infected with smallpox. The pieces of baggage disinfected numbered 2,429, and 194 pieces were inspected and passed.

Plague in Peru.—The official statistics of the plague in Peru shows, in 1910, 706 cases occurring during that year, of which 395 recovered, 291 died, 38 results unknown, and 19 patients remaining for 1911. There were last year 293 cases less than in 1909. It is certain that the plague in Peru is diminishing owing to the greater care the people are taking to prevent infection.

During 1908 there occured the greatest number of cases in Peru, 1,691 cases, 999 cases having occurred in 1909. It has not been reported how many infected localities there were in Peru in 1911, but it would appear that the number of such localities has not increased.

Only 12 cases of plague have occurred in Callao during 1911, which has been the smallest number reported since 1907.

Smallpox.—Small epidemics of short duration occasionally occur on the coast of Peru. In 1910, at Trujillo and in the Chicama Valley, a slight epidemic occurred. Everyone on the coast is willing to be vaccinated, soliciting it voluntarily.

GUAYAQUIL, ECUADOR.

Passed Asst. Surg. Herman B. Parker reports as follows:

Maritime quarantine.—During the fiscal year bills of health were issued to 83 vessels. Of these 64 were bound to the Canal Zone and were subjected regularly to a partial fumigation, thereby complying with the provisions of articles 20 and 22 of the Pan American Sanitary Conference. Three of these vessels were subjected to a complete fumigation owing to the presence of suspected cases of yellow fever. In each instance, however, the laboratory examinations and subsequent clinical course showed the disease to be malarial fever. One vessel was completely fumigated on account of arriving at Guayaquil from Manta, Ecuador, with a case of smallpox on board. One vessel was completely fumigated five times on account of anchoring in front of the city. Certificates of fumigation were issued to 12 vessels bound for San Francisco and Seattle after rat destruction by sulphur gas.

In no instance after inspection and fumigation, according to information received at the service office in Guayaquil, was there a report of a transfer of a quarantinable disease to United States territory from that port during the fiscal year.

During this period seven vessels, bound for New York via South American ports, were inspected and passed and bills of health issued on account of the necessity of fumigation at a southern port before entering a port of Peru or Chili. These vessels were subsequently disinfected at Barbados or Santa Lucia, the last foreign port of call before entering a United States port.

During this period there were inspected 4,701 crew, 1,317 cabin passengers, and 1,962 steerage passengers. Many of these passengers were inspected at the office prior to embarkation, the steamship companies making it obligatory for the steerage passengers. It is under contemplation that the first-class passengers shall also be inspected prior to embarkation, provided it can be accomplished without public comment. Regular certificates are being prepared showing the office inspection, which certificates will be countersigned on board, showing the double inspection. This additional inspection is to be looked upon as an additional safeguard for United States ports, especially Ancon, Canal Zone.

The following is a summary of the quarantine transactions for the year:

Bills of health issued	84
Vessels inspected and passed	7
Vessels fumigated (sulphur)	76
Certificates of fumigation	12
Complete fumigation on account of suspected yellow fever	3
Complete fumigation on account of smallpox	1
Number of crew inspected	4, 701
Number of cabin passengers inspected	1, 317
Number of steerage passengers inspected	1, 982
Baggage fumigated (pieces)	4, 912
Baggage inspected and passed (pieces)	1, 466
Certificates for cargo issued	114

Anchorage.—Ships sailing for the Canal Zone now anchor below a locality known as the "matadero" or slaughterhouse instead of off that point, on account of the gradual growth of the city down the river. The anchorage is more than 200 meters from a shore free from habitations, with the exception of those surrounding the slaughterhouse. The experience of the past year shows the safety of the present anchorage, but with the gradual growth of the city a change must be instituted unless within a certain period Guayaquil is freed from the diseases that are such a menace to commerce and civilization. It is true that commerce is seriously handicapped by the present anchorage and to remove the anchorage a further distance would be a greater handicap; the only alternative would be to permit the ships to anchor off the city, and before sailing give a complete fumigation of the vessel and subsequently detain the ship and personnel in quarantine at Ancon to complete the six-day period of observation.

Hides.—The same system of examining hides adopted last year has been practiced this year and in the absence of any data regarding the transfer of disease by these hides the system may be accepted as good. During the fiscal year 114 certificates were issued; many of these certificates were for points in England and continental Europe and were necessary only to cross the Isthmus of Panama.

Baggage.—During the fiscal year 4,912 pieces of baggage were fumigated and 1,466 pieces inspected and passed. The fumigation is conducted in an appropriate room, sulphur being the agent. As adopted last year, baggage is restricted to wearing apparel as closely as possible; bedding and mattresses are, however, accepted after disinfection in the steam autoclave. Clean baggage is accepted and labeled as "Inspected and passed," as also is baggage from points where plague does not prevail.

Yellow fever on vessels in Guayaquil.—Yellow fever appeared on but one vessel during the period covered by this report, an English sailing vessel over which this office had no authority. This vessel was permitted to dock in the lower part of the town. In all there were 14 cases of fever, with 2 deaths. The type of the disease while characteristic was particularly mild. The crew during their stay in Guayaquil were permitted shore leave.

Plague on board vessels.—During the fiscal year plague was not noted on vessels while in or after leaving this port. This can only be accounted for owing to the anchorage in midstream and the necessity of lightering all freight in open lighters.

Rats on board vessels.—Every effort has been made to reduce the number of rats to a minimum on those vessels over which the service exercises control. It is, however, a difficult task when vessels are permitted to dock in other ports where a certain number of rats are likely to stray on board.

Yellow fever in Guayaquil.—During the fiscal year there were reported 301 cases of yellow fever, a decrease of 87 as compared with the previous year; of these there were 183 recoveries reported and 107 deaths, 3 remaining. Owing to careful fumigation of the hotels the traveling public has not suffered much from the disease, most of the cases appearing among the natives from the interior. An effort was made to eradicate the disease, but the number of cases was but slightly reduced. Appended is a tabular statement showing the progress of the disease, by months.

Yellow fever outside of Guayaquil.—Yellow fever has this year appeared in a number of places outside of Guayaquil, not in large numbers but sufficient to make a widespread infection. In Duran, the terminus of the Guayaquil & Quito Railroad, there were reported three cases with one recovery and two deaths. From Milagro, a small town along the railroad were reported 19 cases with 6 recoveries and 12 deaths, 1 remaining; 14 of the cases occurred in the months of May and June. In Naranjito there occurred 6 cases with 5 recoveries and 1 death. In the hacienda San Antonio there occurred 1 case with 1 death. In Bucay 1 case with 1 recovery. In Babahoyo, a small town about 40 miles up the river, there was reported 1 case with fatal result.

Plague in Guayaquil.—The total number of plague cases in Guayaquil for the fiscal year was 602, of which 376 recovered and 233 died, a mortality of 38.70 per cent. The months of greatest prevalence were September, October, November, and December. While plague existed throughout the year it is a notable fact that with the beginning of the rainy season the disease decreases only to recrudesce during the cooler and drier months of July and August. The fluctuation of plague is in direct accord with the periodical prevalence of fleas, which begins early in the dry season and gradually terminates after the beginning of the rainy season. Nearly all the cases are of the bubonic type, a few are septicemic, and occasionally there occurs a case of the pneumonic form. Practically all the cases are treated with Yersin's serum from the Pasteur Institute and the mortality is believed to be comparatively low.

No case of plague was reported in the foreign shipping owing to the restriction as to anchorage, but in the principal towns where the small river steamers dock plague has appeared, likewise along the railroad to an altitude of 5,000 feet. Taking the history of plague in Ecuador since its introduction it is noted that the disease does not prevail in the altitude where the average temperature is below 65° F., though rats, and especially fleas, are present in enormous numbers.

Appended is a table showing the progress of the disease by months.

Plague outside of Guayaquil.—While a sporadic case of plague may occur at any time in the nearby towns, as a general rule the disease occurs after the period of greatest infection in Guayaquil, the month of January generally furnishing the greatest number of cases. It is interesting to note the spread of the disease along the railroad from station to station until the maximum altitude of about 5,000 feet is reached. In January, 1911, Dr. Parker visited one of the towns and noted that though it was possible in one station to collect six dying plague-infected rats in an hour and a half, but one case of human plague developed, although many people were constantly working in the station.

In Duran there were reported 13 cases, of which 6 died and 7 recovered; in Milagro, 11 cases of which 6 died and 5 recovered; in Ingenio Rocafuerte there was 1 case with 1 death; in the Ingenio Matilde, 1 case with 1 death; in Huigra, 1 case and 1 recovery; in Babahoyo there were 22 cases with 15 deaths and 7 recoveries. It is probable that the infection was more widespread than the above figures indicate, but the means of communication are such that no definite knowledge of these cases is available.

Malarial fevers in Ecuador.—This fiscal year was noted for the large number of cases of malaria, especially the quotidian type, in and around the city of Guayaquil. The mosquito responsible for the infection was the *Anopheles argyrotarsis*, subspecies *albipes.* This mosquito prevailed during and after the rainy season and was the only *anopheles* taken. The number of deaths from this disease is high, but as the death records are not necessarily certified by physicians the actual number is not known.

Smallpox in Ecuador.—According to the reports of the Director of Health for Euador no case of smallpox originated in Guayaquil during the fiscal year. One case was reported as arriving on a ship from Manta, Province of Manavi. It is said that the disease prevails extensively among the Indians in the altitudes, but it has not been possible to verify this.

Hookworm infection in Ecuador.—(From a report of Dr. Parker.)

> Upon my arrival in Ecuador I was imprssed with the severe anemias that prevails here, and shortly after the arrival of my laboratory outfit verified the cause of many of these anemias as hookworm infection. I have not conducted any investigation as to the actual presence of the parasite outside of Guayaquil, but in the places I have visited I have met with the same clinical type of anemia that characterizes this infection. I have noted this anemia more particularly in the coast towns of the Province of Manavi, where the towns are built on or close to the sandy shores of the Pacific and have a primitive sewage disposal and a common unprotected water supply. Fishing, agriculture, and a small amount of commerce are the principal pursuits of these places.
>
> Last fall I visited one of the largest cacao plantations, near Babahoyo, and found that the anemias of hookworm and chronic malaria made available only about 33 per cent of the labor of the 300 employees of that place.
>
> There are few mines in Ecuador, and the manager of the largest of these informed me that they are remarkably free from all infections, owing to the modern disposal of the sewage and a safe supply of drinking water. The later was installed three years ago, after three men had died of dysentery. With these improvements they have been free from that disease and typhoid fever.
>
> Regarding the altitudes a most interesting and opposite condition is met with. Here the natives, more particularly the Indians, are of a distinct physical type, being free from the anemias that characterize the lowlands, having clear complexions, with rosy cheeks, showing the apparent absence of these infections.
>
> In conclusion I would state that nothing is being done in the way of public or private charities to alleviate or eradicate the infection.

Other intestinal parasites.—During the fiscal year many examinations of feces were made with the view of determining the presence of intestinal parasites, and in but few instances only were the intestinal contents free from ova. *Tricocephalus trichiurus* and *Ascaris lumbricoides* predominate and were found to be usually associated. The pork tapeworm, *Taenia solium*, is very common in Ecuador, and in one instance a complete *Taenia saginata*, from a former resident of Chicago, was secured.

Tuberculosis in Ecuador.—Along the seacoast and especially in Guayaquil this disease destroys more lives than plague and yellow fever combined. In the interior the disease prevails extensively, but in the absence of any accurate data no definite figures can be given. Tuberculosis of the lungs and glandular tuberculosis are the most common forms of the disease. As would be expected from this highly actinic light, tuberculous skin lesions are rare. The principal predisposing cause of the disease among the natives is malnutrition, due to poor food and the anemias of hookworm and malarial infections, as well as a tendency that is almost characteristically latin to exclude light and air from sleeping rooms. The course of the disease is extremely rapid.

Leprosy in Ecuador.—Five cases of this disease are always reported on the bill of health for the information of health officers. The actual number of cases is unknown as no attempt at segregation is made. Cases of leprosy are frequently seen about the streets of Guayaquil.

Ecuadorian-Peruvian quarantines.—To the north, Panama, Central American Republics, Mexico, and the Pacific Coast States accept certificates of fumigation from the office of the service in Guayaquil and vessels are granted pratique after the completion of six days, provided no quarantinable diseases have appeared on board. The acceptance of these certificates is according to the spirit of the Pan-American sanitary conferences and their extension to all the ports of the Pacific is but a matter of agreement.

YELLOW FEVER IN GUAYAQUIL DURING THE FISCAL YEAR ENDING JUNE 30, 1911.

	Previously existing.	New cases.	Cured.	Died.	Remaining.
July	2	15	11	6	
August		13	10	3	
September		3		2	1
October	1	16	10	6	2
November	2	18	9	8	3
December	3	16	9	8	2
January	2	39	20	15	6
February	6	51	35	15	7
March	7	41	23	14	11
April	11	31	17	9	16
May	16	30	28	16	2
June	2	18	11	5	3
Total		301	183	107	

PLAGUE IN GUAYAQUIL DURING THE FISCAL YEAR ENDING JUNE 30, 1911.

July	4	10	11	3	
August		26	16	5	5
September	5	87	35	36	21
October	21	168	100	58	32
November	32	104	79	45	13
December	13	85	50	41	8
January	8	56	38	20	6
February	6	36	20	11	11
March	11	18	17	9	3
April	3	3	4	2	
May		7	4	3	
June		2	2		
Total		602	376	233	

HONGKONG, CHINA.

Surg. B. W. Brown, reports as follows:

Bills of health were issued to 440 vessels, carrying 9,131 cabin passengers, 17,889 steerage, and 42,571 in crews; 17,398 steerage and 29,691 members of crews were bathed and 47,062 pieces of baggage were disinfected; 89 vessels were fumigated with sulphur and 580 rats killed (during the period from February to July 1). The crews' quarters on 351 vessels were disinfected with either formaldehyde or bichloride of mercury. The following list of cargo was either stored or disinfected:

	Disinfected.	Stored.
Human hair (cases)	1,930	186
Bristles (cases)	842	90
Hides (pieces)	3,663	
Old rubber (bales)	417	
Feathers (bales)		826
Bone meal (bags)		34,311

The rat reports from the colonial government give a total of 80,411 rats caught during the fiscal year, and of this number 185 were infected.

The following communicable diseases were reported during the fiscal year:

	Cases.	Deaths.
Plague	187	154
Diphtheria	16	1
Enteric fever	78	23
Puerperal fever	9	4
Scarlet fever	1	
Smallpox	178	114
Relapsing fever	5	1

The beginning of the fiscal year witnessed the last cases of the small epidemic of bubonic plague of 1910, July and August showing 7 cases, with 5 deaths. The last case occurred August 25. On April 24, 1911, plague again appeared in Hongkong, the source of infection was not ascertained, and the disease rapidly spread through the Chinese portion of the city, 4 or 5 foci occurring within the first week.

Since the beginning of the epidemic, 180 cases with 149 deaths have been reported, all cases being bubonic. So far no European has contracted the disease.

In reply to inquiries as to the methods of handling the present epidemic, Dr. Francis Clark, medical officer of health for the colony, kindly gave me a detailed account, which is herewith quoted in full.

1. The exclusion of rats from the houses by means of concreted ground surfaces, the prohibition of ceilings in the native quarters, the prohibition of hollow walls, and the protection of all drain openings and ventilating openings by iron gratings.

2. The collection and bacteriological examination of all rats found dead. Facilities for their collection are provided in the shape of a large number of small covered tins containing a carbolic acid disinfectant, attached to lampposts, electric light standards, telephone posts, etc., and in which the inhabitants are invited to put all rats found or killed by them.

These tins are visited twice daily by rat collectors, who take all rats found in them to the bacteriologist, and change the disinfectant in the tin not less than once a week; each rat so found is at once labeled with the number of tin from which it was taken, and if subsequently found to be plague infected a special survey is at once made of the blocks of houses in the immediate vicinity of such tin, all rat holes and rat runs are filled up with broken glass and cement, defective gratings and drains dealt with, and rat poison freely distributed to the occupants, while the occurrence of several plague-infected rats in one locality is a signal for a special house-to-house survey and cleansing of that district.

3. The destruction of rats by rat poison, rat traps, and bird-lime boards, special efforts in this direction being made just before the onset of the regular plague season.
4. The encouraging of the natives to keep cats.
5. The systematic cleansing and washing out of all native dwellings at least once in three months, with a flea-killing preparation; for this purpose we use an emulsion of kerosene, prepared by boiling in a steam-jacketed container 41 gallons of kerosene with 9 gallons of water and 15 pounds of soft soap. This mixture is highly inflammable and it is essential, therefore, the boiling should be done by steam and not by the direct flame.

This mixes readily with water, and 1 gallon is added to every 100 gallons of water used for cleansing floors, skirtings, bedboards, staircases, furniture, etc.

6. An efficient daily scavenging of all streets and lanes and the removal of refuse daily from all houses, coupled with the provision of covered metal dust bins for all houses, to reduce as far as possible the amount of food available for rats.
7. The disinfection of plague infected premises by stripping them and washing them out thoroughly with this kerosene emulsion and the disinfection of infected bedding and clothing, carpets, rugs, etc., by superheated steam.

No objection is raised to the treatment of bubonic-plague cases in native hospitals and no restrictions are imposed in regard to the burial of those dead of plague, except the provision of a substantial coffin, while every effort is made to induce the native population to participate in the above preventive measures, by means of lectures, addresses, and explanations given by myself and by their own leaders, and also by paid peripatetic lecturers who address street crowds.

YOKAHOMA, JAPAN—QUARANTINE AND SANITATION IN JAPAN.

Surg. Fairfax Irwin reports, in part, as follows for the fiscal year ended June 30, 1911:

Summary of transactions.

Steamships inspected and granted bills of health	271
Sailing vessels inspected and granted bills of health	13
War vessels granted bills of health	8
Total bills of health granted	292
Number of vessels fumigated	54
Saloon passengers upon the above vessels	6,542
Second-cabin passengers upon the above vessels	2,139
Steerage passengers upon the above vessels, inspected	25,919
Crew upon the above vessels, inspected	34,208
Persons certified by this office	3,047
Persons required to bathe and undergo special inspection	3,140
Pieces of baggage disinfected under supervision of this service	8,593
Crew bathed	403

On incoming vessels to this port very few cases of quarantinable disease were found. August 15 a case of smallpox was taken from the U. S. S. *Charleston;* August 18 a case of Asiatic cholera was found on the steamship *Siberia*, after passing quarantine. The authorities were notified and the vessel remanded to the quarantine station at Nagahama. September 1 the steamship *Manchuria* arrived from Hongkong with a case of plague aboard. The vessel was held at Nagahama for three days. All precautions possible were taken before the bill of health was granted.

There has been but one case of quarantinable disease reported in Yokohama during the year; an East Indian suffering from smallpox.

The cases of contagious diseases reported were as follows:

	Cases.	Deaths.
Typhoid fever	298	73
Scarlet fever	53	11
Diphtheria	166	56
Dysentery	62	5
Smallpox	1	....

All vessels bound for the Philippine Islands, when empty, were required to be fumigated as also all vessels bound for American ports.

The treatment of steerage and members of crews leaving Yokohama remains the same, all being bathed, and their effects disinfected unless their personal history is proved to be favorable. All steerage passengers from cholera or plague infected districts were detained for observation during the incubation period of the disease.

All consular invoices and boat notes were required to be presented for check, and certificates of origin for foodstuffs had to be presented with the invoices. Also certificates of fumigation for all plants and bulbs destined for California are required.

Disinfection of human hair, skins, and feathers, and personal effects of doubtful origin were required. The quantity of human hair exported from this port has fallen off greatly during the present year.

Sanitary conditions—Empire of Japan.

Cholera.—The total number of cases of this disease reported for the year ended December 31, 1910, was 2,849 cases, and 1,957 deaths, the death rate being 68.69.

Plague.—Osaka and Kobe may be regarded as the danger points for appearance of this disease. The total number of cases reported was 49 with 41 deaths.

Smallpox.—The new regulations enforcing vaccination are well enforced and as a consequence the number of cases of smallpox have been very few. There were reported 80 cases and 13 deaths.

Leprosy.—There has been nothing new reported concerning this disease during the past year, and no more has been heard of the isolation hospital mentioned in former reports. As has been previously stated, there are reported to be in Japan 37,431 leper beggars, and 5,877 having fixed houses.

Dysentery.—This disease continues to show an increase; the number of cases given is 31,960; deaths, 7.053.

Tyhoid fever.—This disease also shows an increase in total; cases 35,270 and 7,571 deaths.

Scarlet fever.—Of this disease there were reported 2,359 cases and 464 deaths.

Diphtheria.—There were 19,088 cases and 5,065 deaths of this disease, a slight increase.

Typhus fever.—This disease appears to be almost extinct in Japan, 5 cases and 4 deaths were reported.

Sanitary conditions in Yokohama.—The population of Yokohama according to the last census is given as 419,630. The registered births were: Male, 4,794; and female, 4,732; making a total of 9,526. The deaths were 5,794. The annual death rate was 13.8, as compared with 16.002 last year. The official report of contagious diseases has been given in a previous paragraph. There have been no cases of plague or cholera and but one case of smallpox. The last case of human plague reported at this port was on July 12, 1909, and the last plague rat found was on July 23, 1909.

The following figures, not, however, pertaining to Japan, may be of some interest. The great epidemic of plague in Manchuria, which required such extreme vigilance on the part of officers of this service, began November 8, 1910, and caused up to March 10, 1911, 31,432 deaths, of which 1,656 were in Mukden.

Formosa.—Official reports indicate that the epidemic of plague in Formosa is gradually subsiding; bubonic plague has always been more or less epidemic at Kagi, Formosa, a town on the railroad, 125 miles south of Taipeh. The port nearest to Kagi is Takaw. There is a good deal of shipping between Takaw and the main land of China. Strange to say, if we adopt the theory that the disease was brought from China, there have been very few cases at Takaw. The opinion of Japanese medical men is that plague is endemic at Kagi, and must have been brought there at a remote period. The proximity of growing sugar cane and the presence of sugar mills would suggest a congenial habitat for rats.

KOBE, JAPAN.

Acting Asst. Surg. Garland P. Moore reports in part as follows on the transactions at this station during the fiscal year ending June 30, 1911:

Steam vessels inspected and granted bills of health	265
Sailing vessels inspected and granted bills of health	1
War vessels inspected and granted bills of health	5
Total bills of health granted	271
Passengers on the above vessels inspected	27,703
Crew on the above vessels inspected	28,459
Pieces of baggage disinfected	12,214
Number of persons bathed, disinfected, and their effects disinfected	2,011
Vessels fumigated	27
Pieces of freight inspected and disinfected	33,727

Manifests viséed for 198,543 tons of cargo.

During the fiscal year ended June 30, 1911, Kobe was infected with plague, there was a violent epidemic of cholera, and from time to time smallpox has been present. The last case of human plague was reported in August, 1910.

The first case of cholera occurred September 12, 1910, in the person of a "lighter" coolie, who assisted in discharging the cargo from the steamship *Amakusa Maru*, from Dalny and Shanghai. During the next week a dozen or more cases appeared, all of them being "lighter" coolies. Many of those stricken with the disease returned to their homes in widely separated parts of the city, and in this manner created many foci of infection. The epidemic raged until the middle of November, when it began to decline, ceasing entirely about the middle of December. The total number of cases in Kobe reached 607, with 396 deaths. In Osaka, 20 miles from Kobe, an epidemic of cholera was even more severe than in Kobe, there being 951 cases, with 692 deaths. The disease, following the channels of trade, spread rapidly all along the eastern seacoast of Japan, the total number of cases for the entire empire being 2,770, with 1,923 deaths. The average death rate was 69.42.

During the prevalence of cholera the special regulations with particular reference to this disease were rigidly enforced. Communication between the shore and ships in the harbor destined for American ports was kept at a minimum. No water, ballast, or foodstuffs were taken by ships.

All steerage passengers for American ports were held in quarantine for five days, bathed, disinfected, and their effects disinfected by steam prior to embarkation. All lighters conveying cargo and all launches carrying passengers to ships were disinfected under the supervision of the United States Public Health and Marine-Hospital Service. In the beginning of the cholera outbreak great difficulty was experienced in preventing fruit vendors from the shore going alongside ships in sampans and selling food and fruit to the crews and Asiatic steerage passengers. The buyers on the ship would let down a bucket, fastened to a rope, to the sampan, and by this means hoist the fruit on board. After a few days of almost unceasing vigilance this trouble was overcome. All cargo likely to convey infection, and which could not be disinfected, was excluded from shipment.

The operations of the service at Kobe were notably increased over the previous fiscal year, and involved the inspection of all vessels destined to American ports, the Philippines, and Honolulu, the inspection of all steerage passengers sailing from Kobe for the United States, bathing them, and disinfecting their baggage and clothing by steam.

During the prevalence of cholera or plague all steerage passengers are isolated and detained in quarantine the requisite number of days. A careful supervision of freight was maintained by requiring all shipping orders and cargo manifests to be submitted to the medical officer in charge for countersignature and approval. Such cargo as cereals, grain, bran, etc., was inspected prior to shipment, and required to be stowed in rat-proof warehouses and to be packed in new sacks, free from holes.

Kobe is the principal port for the transshipment of cargo from Manchuria and North China ports, and during the epidemic of plague last winter the supervision of freight from those places was carefully made, and such cargo as was likely to carry infection was refused shipment when it could not be properly disinfected.

During the year 27 vessels were fumigated with sulphur dioxide gas. The fumigation by SO_2 of all lighters carrying freight to ships bound for United States ports was done to exterminate rats, which usually infest lighters and are liable to gain access to ships in the cargo. Hundreds of rats were killed in this way.

The official report as to contagious diseases in Kobe shows for the year ending June 30, 1911:

	Cases.	Deaths.
Cholera	607	396
Plague	2	1
Smallpox	9	3
Dysentery	141	55
Typhoid fever	146	48
Diphtheria	130	52
Total	1,035	555

No statistics relating to tuberculosis and leprosy are obtainable. That tuberculosis exists to an alarming extent is generally recognized. There is apparently no effort made by the Japanese in Kobe to segregate the lepers, who may be seen daily on the streets and amongst the crowds in the temple grounds. Hookworm is widely prevalent, especially among the farmers in the rural districts, and it is not to be wondered at when it is remembered that they plod with bare feet and legs through the muck of paddy fields which are fertilized by human excrement.

LIBAU, RUSSIA.

Owing to the prevalence and spread of Asiatic cholera in Russia and the danger of the importation of this disease through immigrants arriving in the United States, a medical officer of the service, Acting Asst. Surg. C. M. De Forest, was assigned to duty in the office of the American consul at Libau, Russia, on September 26, 1908.

Transactions.—The transactions for the fiscal year ended June 30, 1911, are as follows:

Number of passengers examined (two inspections)	22,047
Number of passengers sailed	20,001
Number of passengers detained	2,046
Number of passengers with disease certified to	1,593
Number of passengers accompanying those detained	453
Number of crews examined	2,848
Pieces of baggage inspected for foodstuffs (in nine months)	10,337
Pieces of baggage disinfected (whole year)	5,146

During the past year the emigration situation in Libau has remained practically unchanged. The emigrants have been examined as formerly and held the full five days in quarantine under observation. Upon arrival in Libau they are examined by the representative of the Public Health and Marine-Hospital Service, and each passenger or family given a green card, if in good health, stating that they are free from quarantinable disease. This card is stamped by the representative of the Public Health and Marine-Hospital Service, and all passengers who are to be allowed to sail are examined up until the evening of the sixth day previous to sailing. Then they are held under the observation of the sanitary officials of Libau and again examined and the cards stamped " Second inspection " upon embarkation. Those suspicious of having or those actually having infectious diseases, or those having no green card stamped, are not allowed to sail. Last year there were more cholera cases in Russia than in the former two years combined, there being about 220,000 cases, with over 102,000 deaths, while in 1908 there were but 12,000 deaths, and in 1909 there were 28,000 deaths. The disease was present in every part of Russia with the exception of Poland and Finland. To insure greater safety against cholera appearing on board the steamers, all the baggage of the passengers is examined for foodstuffs, which is confiscated. This examination is made upon the arrival of the passenger in Libau, and again upon the day of sailing, by the sanitary assistant of the Public Health and Marine-Hospital Service, under the supervision of the medical officer in charge. All baggage containing dirty or soiled clothing is disinfected by formaldehyde gas. The disinfecting is done by one of the chief sanitary officials of the Libau health department.

The inspection of the ship is made on the day of sailing. The officers and crew of the ship are examined five days previous to sailing and a second time on the day of sailing. It is required that the ship's doctor be on board the whole of the five days previous to sailing and that he make at least one complete physical examination of the crew. No new man for the crew is taken on who has not been in Libau for two weeks or more. No passenger or member of the crew is allowed to sail if intoxicated, because if ill it only serves to mask any symptoms that might otherwise appear.

Examination of the passengers is begun about 10 days before sailing and then each day as they arrive in Libau.

The disinfection of the necessary parts of the cargo is carried out under the supervision of the American consular agent in Libau. All disinfection of the cargo is carried out either at Libau or at Riga instead of at the initial point of shipment, as was formerly done.

The housing of the emigrants has not been satisfactory, and to better the conditions the steamship company (Russian-American Line) is now constructing barracks for the emigrants. In connection with this will be a steam disinfecting apparatus.

During the past year several slight epidemics of smallpox have occurred in Libau. From July 1, 1910, until July 1, 1911, there occurred 49 cases, with 6 deaths. Now all passengers upon their arrival in Libau are vaccinated by the method used by the Board of Health of the City of New York, at which time they are given a card stating that they have been vaccinated, which card they are required to show to the examining officer as they embark. The results of the vaccinations have, since the beginning of the use of the new method stated above, proved entirely satisfactory. There are about 90 per cent of "takes," compared to about 15 per cent by the method formerly used.

During the present year (since January) cholera has been absent from Russia until May 8, when one case was reported at Vosnessensk, near Ananjev; another on June 18, at Disna, on the Duna River.

NOTE.—The Public Health Reports contain statistics regarding the cholera situation in Russia.

During the past year bubonic plague has been reported in European Russia in Odessa, Akkerman, Astrachan Government, Nikolajev, Baku, Batum, Chersson, Uralsk, Prschevalskaja, and in the Orenburg Government. Some were of the pneumonic type. More cases have probably occurred, but have not been reported. It has been occurring annually in Odessa for the past eight years, but the reports have been suppressed. During the past year there have occurred in Odessa 143 cases, with 43 deaths. As many suspects were reported. Infected rats were found on the docks and the stamping out of the disease was due to the extermination of the rats. When cases were occurring there regularly, passengers from there were held in quarantine in Libau for seven days and all their baggage was disinfected, both by formaldehyde gas and by sulphur dioxide. No cases had been reported there from February until June 23, when two cases were reported.

In the Government of Astrachan there occurred during the past year 189 cases, with 141 deaths. More cases have without a doubt occurred there, but many of the places are so isolated that it is often several months before the news of anything happening reaches the outside world.

During the past year a sanitary assistant has been added to the staff at Libau, whose duty is to examine the baggage for foodstuffs. He is also employed by the steamship company to vaccinate all the emigrants.

The steamship company have under construction an office building to be used exclusively for passenger purposes, and there the examination of passengers will be carried out even more carefully and thoroughly than at the present time.

CALCUTTA, INDIA.

Acting Asst. Surg. W. S. Allan reports, during the fiscal year ending June 30, 1911, as follows:

Transactions.

Total number of vessels inspected	56
Total number of passengers examined	41
Total number of crews examined (European)	964
Total number of crews examined (Asiatic)	2,349
Number of vessels disinfected in accordance with quarantine regulations	56
Total number of Asiatic crews whose effects were disinfected	2,349
Total number of Asiatic passengers whose effects were disinfected	27

Bills of health are granted after the following precautions have been taken: (1) The holds of the vessels fumigated with sulphur dioxide gas; (2) vessels, when moored to wharves, provided with rat guards on wharf lines; (3) clothing and baggage of crews and Asiatic passengers are disinfected; (4) food supply inspected and passed; (5) water supply found satisfactory.

Deaths from quarantinable diseases during the fiscal year.

	Cholera.	Plague.	Smallpox.	Leprosy.
1910.				
July	81	101	1	9
August	40	33	1	4
September	54	25	2	11
October	84	42	2	4
November	138	35	4	10
December	119	63	3	15
1911.				
January	123	44	2	1
February	171	52	3	7
March	177	169	5	3
April	301	648	22	9
May	191	334	7	6
June	183	193	3	8
Total	1,662	1,739	55	87

Census.—The population of Calcutta, according to the census taken early in 1911, was 890,493, as against 847,796 in 1901. The growth of the population of the city proper has been 5 per cent, while the suburbs have increased 45 per cent. The male population has increased 6.8 per cent, while the female population has only advanced 1.1 per cent.

Death rate.—The death rate for 1910, based on the new census figures, was 26.7 per 1,000, and is the lowest recorded for over 20 years. The total mortality was 23,728, as against 28,946 in the previous year. The difference is almost entirely due to the diminished mortality from epidemic diseases, more particularly cholera, plague, and small pox.

Cholera.—The returns for the year 1910 are as follows: The mortality was, 1901, giving a rate of 2.35 per 1,000, as compared with 2,022 in the previous year. The greatest number of deaths occurred in the first six months of the year.

Plague.—The recrudescence of plague in the first six months of the year was the mildest experienced since 1898. In that period 993 deaths were reported, a little over half the number recorded in the same period of 1909. During the remainder of the year 269 deaths were reported, making a total for the year of 1,262. This represents a death rate of 1.4 per 1,000. The number of rats destroyed during the year amounted to 89,315, and the dead rats found in the streets were reported at 28,814.

Smallpox.—The number of deaths for 1910 amounted to 48, of which 36 occurred in the first 5 months of the year.

Measles.—This disease has been much more prevalent; 240 deaths having been recorded as against 85 in 1909.

Diphtheria.—Total number of deaths 46, more than double that of 1909.

Beriberi.—For the year 1910, 171 deaths were reported, 152 in the first six months. Roughly, the deaths of females were three times more numerous than those of males.

Enteric fever.—Number of deaths 330, as against 240 for 1909.

Malaria.—There have been a few more deaths from this disease (1,463) in 1910 than in the previous year (1,393), but there has been a marked decline in the mortality from malaria since 1905. The treatment of tanks, surface drains, marshy ground, etc., with kerosene oil is causing a marked diminution in the number of cases.

Other fevers.—Under this heading are varieties of fevers which under the system of death registration are not differentiated. The mortality from these grouped figures is declining year by year, the total of 1,250 for 1910 comparing favorably with former years.

Dysentery and diarrhea.—Number of deaths 1,807, as against 1,780 for 1909.

Tuberculosis.—This heading includes phthisis, which caused 1,878 deaths; other forms of tuberculosis caused 93 deaths. These figures are approximately the same as for 1909.

Diseases of respiratory organs.—The mortality caused by these diseases was 4,781, or 5.4 per 1,000, against 4,994 in 1909, made up as follows:

Acute bronchitis	1,670
Chronic bronchitis	1,503
Broncho-pneumonia	717
Acute pneumonia	652
Other less common forms	239
Total	4,781

NAPLES, ITALY.

Surg. H. D. Geddings reports as follows for the fiscal year ending June 30, 1911:

Transactions at Naples and Palermo, Italy.

Months.	Ships.	Emigrants.		Baggage.	
		Naples.	Palermo.	Inspected.	Disinfected.
July, 1910	18	9,300	677	2,345	11,040
August, 1910	21	9,656	2,751	5,735	14,070
September, 1910	24	8,535	3,206	6,234	12,400
October, 1910	11	2,569	1,307	2,108	4,494
November, 1910	22	11,166	1,840	5,340	17,147
December, 1910	14	4,597	1,145	3,130	8,060
January, 1911	19	6,956	922	3,016	10,125
February, 1911	21	9,192	807	2,513	13,050
March, 1911	36	32,139	3,851	8,565	44,726
April, 1911	34	19,534	3,246	6,008	27,340
May, 1911	26	10,444	1,487	4,141	15,875
June, 1911	25	7,552	903	2,915	10,655
Total	271	131,640	22,142	52,050	188,982

Rejections recommended.

Months.	Trachoma.	Favus.	Suspected trachoma.	Suspected favus.	Measles.	Scarlet fever.	Smallpox.	Other causes.	Total.
July, 1910	257	14	149		1		1	112	534
August, 1910	360	23	257					159	799
September, 1910	413	31	278					123	845
October, 1910	119	5	101		1			37	263
November, 1910	437	26	185	1				97	746
December, 1910	222	18	109					57	406
January, 1911	289	35	151					68	543
February, 1911	292	31	135					52	510
March, 1911	944	61	624	1		1		214	1,845
April, 1911	586	48	457	1				167	1,259
May, 1911	285	23	216	1			1	94	620
June, 1911	165	18	81					69	333
Total	4,369	333	2,743	4	2	1	2	1,249	8.703

Comparison with last two years.

Year.	Number of emigrants inspected.	Number of emigrants embarked.	Baggage.		Rejections recommended.
			Disinfected.	Passed.	
1908-9	211,424	200,996	238,365	41,139	10,428
1909-10	214,332	202,831	237,650	59,521	11,501
1910-11	162,485	153,782	188,982	52,050	8,703

CHOLERA IN ITALY, 1910.

On August 17, 1910, the presence of cholera in the Province of Bari, region of Apuglia, was announced by the sanitary authorities of the Kingdom. It is very probable that the disease had prevailed for ten days to two weeks prior to the first announcement, for within two or three days from the date given above the presence of the disease was verified in at least eight places in the Provinces of Bari and Foggia, which together with the Province of Lecce (later infected) go to make up the Apuglia district or region.

The source of the infection is not positively known. At the time of its first appearance the introduction was attributed to a band of wandering gypsies, who, coming from Batum by steamer, landed and located themselves in the city of Trani, one of the small ports in which the coast of Apuglia abounds. But as these gypsies were all subsequently rounded up, and held for observation with bacteriological examination of feces with negative results, this theory is untenable. Another story attributes the introduction to a band of Dalmation fishermen, but this also is not susceptible of proof.

Active measures were at once inaugurated by the Italian sanitary authorities to meet the situation, but owing to local conditions, chief among them being the lack of adequate water supplies throughout the entire region, the infection spread repidly from place to place, and finally overran the three Provinces of Bari, Foggia, and Lecce. As the operations in these Provinces did not come under the direct observation of this service, but little can be said of them except from hearsay, and the outbreak is only of interest for us as being the immediate cause of the infection of Naples, to which we next must pass in chronological order.

CHOLERA IN NAPLES, 1910.

The Apuglia region is in most intimate commercial relations with Naples both by land and sea, and from the moment of the appearance of cholera in Bari and the rest of Apuglia, the more or less rapid infection of Naples and other districts in Italy became a foregone conclusion. There is no reasonable doubt that cholera existed in Naples as early as August 27. During this period, from August 27 to September 24, there occurred in Naples city about 670 cases with 331 deaths from "gastroenteritis," the mortality of which in the early days of its appearance amounted to nearly 90 per cent, and as will be seen from the figures above for the entire period amounted to practically 50 per cent.

SERVICE MEASURES TAKEN IN NAPLES.

All steerage passengers from the actually infected districts were immediately upon arrival embarked upon the quarantine ship *Marsala*, and were there detained for five full days, with bathing, disinfection of personal effects, and bacteriological examination of feces for cholera vibrios, which were repeated until two successive examinations with a day's interval gave negative results. Over 3,000 examinations of the feces of more than 1,600 detains were thus made with the discovery of 12 bacillus carriers, none of whom were ill or gave any history of recent illness.

All other steerage passengers were isolated for five days in a large building known as the "Asilo dei Emigranti" and were subjected to bathing, disinfection of baggage, and strict medical supervision. These operations were committed to the charge of medical officers of the Royal Navy, and it is needless to say in respect to them, that they were carried out with rigor, precision, and absolute honesty.

As soon as cholera was officially declared, these precautions were naturally continued as a matter of course.

Passengers of the second class were quartered in approved hotels or lodging houses, were interdicted from holding communication at random with the city, and were visited daily by the physicians of the steamship companies for five days, all under the supervision of the service officer.

Passengers of the first class were required to quarter themselves in approved hotels of the first class, and while allowed liberty of visiting and sightseeing about approved parts of the city, were enjoined as to care in diet, and advised to refrain from taking their meals at other than the hotels at which they were domiciled. This was for the reason that many of the seaside restaurants, for some reason so popular with tourists, seemed to be the site of choleraic infection, due probably to the sea food which is a specialty of these resorts.

RESTRICTIONS ON MERCHANDISE.

These were reduced to a minimum. Early in the outbreak it became necessary to adopt some system compatible alike with the public-health interests of the United States and the commercial interests of the port of Naples. Bearing in mind a report made to the International Sanitary Conference of Paris of 1903, and to a declaration therein contained that "there is no merchandise capable in itself of transmitting cholera and pest, but that such articles are dangerous only when contaminated by the dejecta of those suffering from cholera," etc., a careful study was made of the methods of production of the articles of commerce offered for shipment, and when it was found that these operations were carefully carried out in quarters or factories free from infection, and by operatives in good health and with due observance of personal cleanliness, that the finished products were packed in bales or cases fitted to protect them from the damage incident to a transport by sea, and that they were finally stored and handled so as to protect them from the possibility of human fecal contamination, no objection was interposed to their embarkation, the actual work of putting the cargo on board ship being performed by stevedores, who were under constant medical supervision. Naturally some articles, as rags, hides, and hide parings (glue stock), human hair, unless rendered mechanically clean and washed in a chemical solution, and a few others, were interdicted. A careful inquiry was made into the cheese question, and it was found that so-called fresh cheeses were not offered for shipment and that they were incapable of undergoing transportation without rapidly spoiling. Most Italian cheeses exported are heavily salted, or are so acid from the production of lactic, butyric, and other organic acids that they are not culture media for cholera vibrios, and in addition these cheeses, intended for export, are externally oiled and given a heavy coating of baryta, or the carbonate of barium, thus forming a heavy, almost impervious crust. This system of individual classification had the immediate effect of raising an embargo on merchandise to the value of 30,000,000 francs, which had been put into store under a misapprehension, and relieved a very onerous financial strain.

EXTENT OF THE EPIDEMIC.

Spreading from the Apuglia into Naples and Sicily, the disease rapidly gained headway, and extended in a northerly direction, involving almost every Province in southern Italy and many communes in each Province. The disease reached Rome, but officially did not extend farther north, though this admits of some doubt, and leaves many singular happenings to be explained on doubtful hypotheses. A table giving the extent of the disease by Provinces and the mortality therefrom, compiled from official sources by Passed Asst. Surg. W. W. King, follows, and, while officially correct, probably only approximately represents the ravages of the disease. For the comparative smallness of the outbreak in the city of Naples, as compared with the population, and considering the character of the people, thanks must be rendered to the admirable nature of the public water supply, and but little credit given to official activity. With a water supply such as is at present distributed, it is believed that the occurrence of a disastrous cholera epidemic in Naples may be considered among the impossibilities.

Cholera in Italy.

Province.	Date.	Cases.	Deaths.
Naples (excluding city)	Sept. 24 to Nov. 17, 1910	492	160
Bari	Aug. 17, 1910, to Feb. 3, 1911	432	276
Lecce	Oct. 19, 1910, to Jan. 31, 1911	135	27
Caserta	Sept. 29, 1910, to Jan. 9, 1911	299	160
Palermo (excluding city)	Sept. 20 to Dec. 29, 1910	87	26
Catanzaro	Dec. 30, 1910	2	2
Perugia	Nov. 7, 1910	2	....
Sassari	Sept. 27, 1910	7	1
Girgenti	Oct. 20 to Dec. 6, 1910	7	2
Caltanisetta	Nov. 8 to Dec. 21, 1910	8	6
Aquila	Dec. 5 to 13, 1910	4	1
Campobasso	Oct. 10 to Nov. 13, 1910	8	2
Avellino	Sept. 30 to Oct. 17, 1910	9	4
Foggia	Aug. 18 to Oct. 13, 1910	224	129
Messina	Oct. 20, 1910	1	....
Trapani	Oct. 20 to Nov. 10, 1910	3	1
Rome	Sept. 15 to Dec. 29, 1910	106	24
Salerno	Sept. 29, 1910, to Jan. 1, 1911	49	13

EPIDEMIC OF CEREBROSPINAL MENINGITIS IN GREECE.

On account of the reported presence of epidemic cerebrospinal meningitis in Greece a request was made of the Department of State to cable to the American consul general at Athens, Greece, for a report concerning the existence of cerebrospinal meningitis in that country. In response to a cabled inquiry sent on March 25, a reply was received dated March 27, which stated that in the past three months there had been 219 cases of the disease mentioned, and 55 deaths therefrom, in the cities of Athens and Piraeus. The consul general also reported that during the same period there had been 289 cases and 49 deaths in the Provinces.

With a view of preventing the entrance of this disease into the United States by means of the steamship lines plying between Piraeus and Patras and ports in the United States, the consul general at Athens was authorized to employ two physicians, one for duty at Piraeus, the port of Athens, and the other for duty at Patras. These physicians, operating under the direction of the consul general at Athens, were directed to detain immigrants who had been exposed to cerebrospinal meningitis for 10 days before departure, after the last exposure. In order to prevent immigrants from embarking at Kalamata and Gythion, at which places it was impracticable to place medical officers, an arrangement was effected for the embarkation of all persons either at the ports of Piraeus or Patras, where they were detained under observation. In addition to the detention for 10 days of immigrants departing from Greece, their baggage and personal effects were disinfected. This inspection service was maintained for two months, being discontinued on June 8, 1911; this on account of the fact that the epidemic had practically ceased. The transactions during this period were as follows:

Ship.	Port and date of sailing.	Number of emigrants embarked and suspected cases detained.		
		Port.	Embarked.	Detained.
Patris	Piræus, Apr. 4, 1911	Piræus	592	39
		Gythion	179	67
		Kalamata	135	18
		Patras	301	60
			1,207	184
Themistocles	Piræus, May 6, 1911	Piræus	314	26
		Gythion	64	17
		Kalamata	101	14
		Patras	328	16
			807	73
Patris	Piræus, May 17, 1911	Piræus	471	19
		Gythion	156	15
		Kalamata	90	12
		Patras	430	4
			1,147	50
Athinai	Piræus, May 21, 1911	Piræus	814	6
		Gythion	62	10
		Kalamata	73	6
		Patras	241	....
			1,190	22
Martha Washington	Patras, Apr. 10, 1911		962	25
Laura	Patras, Apr. 17, 1911		140	10
Argentina	Patras, Apr. 26, 1911		124	2
Oceania	Patras, May 15, 1911		548	34
Alice	Patras, May 22, 1911		169	10
Martha Washington	Patras, May 29, 1911		870	41
Laura	Patras, June 5, 1911		191	6

Total number of emigrants embarked at all ports during period of special inspection 7,355
Total number of suspected cases detained during period of special inspection 457

MEDICAL INSPECTION OF IMMIGRANTS.

In accordance with the immigration act of February 20, 1907, the medical inspection of all aliens arriving at the various ports in the United States, its possessions and dependencies, is conducted by officers detailed for that purpose.

During the fiscal year 26 commissioned officers and 51 acting assistant surgeons were assigned to this work exclusively. In addition a large number of officers, primarily detailed to other service duty, have examined aliens whenever presented to them.

Those officers of the service stationed at consulates for quarantine duty in Italy have also made inspections of departing aliens at the request of the Department of Commerce and Labor. This work has exceeded in volume and difficulty the quarantine function.

Medical inspection of alien immigrants is now being conducted at 82 stations.

During the fiscal year ended June 30, 1911, 1,093,809 immigrants were examined by medical officers of the service to determine their physical and mental fitness for entrance at ports in the United States and its dependencies, Porto Rico and Hawaii. During the fiscal year 27,412 aliens were certified for physical reasons.

The following table furnishes a summary of the transactions at the several ports in the United States and its dependencies and in Canada:

Table showing number of aliens inspected and certified at all ports and places in the United States and its dependencies, and in Canada.

	Number of aliens examined.	Number of aliens certified.					Important diseases for which certification was made.										
		Class A (1): Idiocy, imbecility, feeble-minded, epilepsy, insanity, and tuberculosis.	Class A (2): Loathsome contagious or dangerous contagious.	Class B: Disease or defect which affects ability to earn a living.	Class C: Disease or defect of less degree.	Total.	Trachoma.	Tuberculosis.	Insanity.	Idiocy.	Imbecility.	Epilepsy.	Feeble-minded.	Favus.	Syphilis.	Tinea tonsurans.	Gonorrhea.
Aquadilla, P. R.	1	0	0	0	0	0											
Astoria, Oreg.	1,857	4	0	0	2	6	1	2							1		
Baltimore, Md.	23,543	3	28	219	242	492	24	2	1				2	1	1		
Bellingham, Wash.	265	0	0	0	0	0											
Boston, Mass.	54,759	17	45	475	2,014	2,551	24	4	9		2		2	5	1	8	2
Blaine, Wash.	242	1	1	10	4	16			1						1		7
Brownsville, Tex.	1,553	2	62	28	24	116	44						2		1		
Brunswick, Ga.	4	1	0	1	0	2		1									
Buffalo, N. Y.	3,936	21	72	35	54	182	65	5			9	3	1	1			
Calexico, Cal.	395	2	1	1	0	4		2									1
Charleston, S. C.	54	0	0	0	0	0											
Chicago, Ill.	19	8	3	2	1	14	2	1	2				1				
Cincinnati, Ohio.	3	1	2	0	0	3		1									1
Del Rio, Tex.	495	1	6	0	3	10	6						1				
Detroit, Mich.	6,852	29	116	435	200	780	71	1	2		1	1	24		6		26
Douglas, Ariz.	5,653	3	12	10	0	25	11	1					2		1		
Duluth, Minn.	4,159	18	2	3	7	30	1	9	7				1				
Eastport, Idaho.	2,686	4	4	93	3	104	1	2		1			1		1		1
Eagle Pass, Tex.	5,987	0	0	0	37	37	17	2			3	2			10	1	
El Paso, Tex.	24,434	24	33	101	5	163	5	13	4	1		2	5		4		12
Everett, Wash.	160	1	2	0	1	4			1						1		1
Fajardo, P. R.	0	0	0	0	0	0											
Fernandina, Fla.	0	0	0	0	0	0											
Galveston, Tex.	5,550	3	1	88	1	93	43					1	1	1	1		
Gloucester, Mass.	0	0	0	0	0	0											
Halifax, Nova Scotia	4,788	4	70	44	153	271	70										
Hidalgo, Tex.	265	0	0	0	3	3	2					1					
Honolulu, Hawaii	4,976	3	160	5	28	196	151	1					2		1		7
Humacao, P. R.	0	0	0	0	0	0											
Jacksonville, Fla.	0	0	0	0	0	0											
International Falls, Minn.	840	3	6	4	22	35	4	2									
Kahului, Hawaii	0	0	0	0	0	0											

Ketchikan, Alaska	168	0	0	0	0	0											
Key West, Fla	3,133	1	5	0	0	6	5		1								
Laredo, Tex	13,623	14	30	83	14	141	28		3	3	1	2	5		1		1
Lethbridge, Alberta, Canada	173	0	0	0	1	1	1										
Los Angeles, Cal	885	1	1	0	10	12	1	1									
Marcus, Wash	1,269	0	8	9	63	80	50										3
Mayaguez, P. R	211	1	30	0	1	32	30	1									
Miami, Fla	3,271	0	2	0	0	2	2										
Mobile, Ala	103	0	0	0	0	0											
Montreal, Canada	8,216	64	0	204	328	596	28	25	2	2	1		2		2	1	
Naco, Ariz	3,977	0	14	1	0	15	3								4		5
New Bedford, Mass	1,428	1	0	0	13	14											
New Orleans, La	4,058	6	22	52	55	135	16	3	4					1	2		1
New Orleans quarantine station	379	0	0	0	7	7											
Newport News, Va	372	0	0	0	0	0											
Newport, Vt	290	2	2	13	0	17			1								
New York, N. Y	749,642	243	1,363	11,072	4,232	16,910	1,167	34	70	11	24	10	94	68	10	54	147
Niagara Falls, N. Y	7,477	18	118	97	39	272	109	3	2	2		2	9	1	3		5
Nogales, Ariz	4,314	4	9	12	2	27		1	2				1		7		
Norfolk, Va	240	5	3	0	2	10											
Pascagoula, Miss	13	0	0	0	0	0											
Perth Amboy, N. J	15	0	0	0	0	0											
Philadelphia, Pa	46,857	17	262	649	391	1,319	153	7		2			2	9	3		1
Pittsburgh, Pa	3	0	1	0	1	2	1										
Ponce, P. R	0	0	0	0	0	0											
Portal, N. Dak	573	12	2	14	9	37		6	2	1			3				1
Port Arthur, Tex	2,239	1	2	4	4	11						1			20		2
Port Huron, Mich	3,161	20	32	230	4	286	15	4	8		1	3	6			5	
Portland, Me	7,323	0	17	75	0	92	17							6			
Portland, Oreg	14	1	2	0	0	3			1						2		
Port Tampa, Fla	4,297	2	1	1	13	17	1	1				1					
Port Townsend, Wash	11,881	0	42	36	6	84	18								13		10
Quebec, Canada	17,840	13	56	117	84	270	54	4	4				3	1			1
San Diego, Cal	113	2	1	3	0	6		2							1		1
San Diego quarantine	1,559	1	0	0	1	2	1										
San Francisco, Cal	10,353	5	753	243	11	1,012	88	2	3						2		3
San Juan, P. R	2,741	0	23	3	0	26	22										
Savannah, Ga	16	0	0	0	16	16											
Seattle, Wash	2,578	1	20	22	2	45	5	1							1		1
St. John, New Brunswick	3,230	0	6	21	15	42	6										
Sault Ste. Marie, Mich	2,143	9	25	57	157	248	13	6	1			1	1	2	3		3
Sumas, Wash	1,701	7	73	7	1	88	58	4	2				1		6		4
Tacoma, Wash	1,520	2	28	1	1	32	28	2									
Tampa Bay quarantine, Fla	5,587	0	12	0	0	12	11	1							1		
Tucson, Ariz	131	1	6	3	4	14											
Vancouver, British Columbia	4,089	30	4	0	59	93	21	4									
Victoria, British Columbia	1,754	5	1	2	15	23	5										1
Wilmington, N. C	1	0	0	0	0	0											
Winnipeg, Canada	5,372	8	12	153	45	218	5	5	1			2					1
Total	1,093,809	650	3,614	14,738	8,410	27,412	2,504	166	134	23	42	82	172	96	111	69	249

THE DETAIL OF A MEDICAL OFFICER TO ACCOMPANY THE SPECIAL AGENT OF THE HAWAIIAN TERRITORIAL BOARD OF IMMIGRATION TO MADEIRA AND THE AZORES TO EXAMINE INTENDING EMIGRANTS BEFORE EMBARKATION.

In compliance with a request made by the governor of the Territory of Hawaii, a medical officer of the service was detailed on August 28, 1909, to join the Hawaiian Territorial immigration agent in London, and to accompany him to Madeira and the Azores for the purpose of making medical examinations of all intending emigrants before their embarkation for Hawaii. It was intended by this means to avoid the acceptance at the port of embarkation of any emigrant who, by any mental or physical defect, might be disqualified from landing at Hawaii under the Federal immigration laws.

On February 2, 1911, another medical officer was given a similar detail to accompany the Hawaiian Territorial immigration agent to Lisbon, Portugal.

Transactions.

Number of emigrants examined at Oporto, Portugal	417
Recommended for rejection	18
Number of emigrants examined at Lisbon, Portugal	280
Recommended for rejection	6
Number of emigrants examined at Gibraltar	1,037
Recommended for rejection	32

EXCERPTS FROM REPORTS MADE BY SERVICE OFFICERS DETAILED FOR THE MEDICAL INSPECTION OF IMMIGRANTS.

BOSTON, MASS.

Acting Asst. Surg. M. Victor Safford reports, in part, as follows:

During the year 383 passenger ships, subject to inspection by the officers of the service, arrived at the port of Boston, bringing a total of 65,778 passengers. This number represents a decrease of about 5,000, as compared with the preceding year, and indicates Boston's share in the general decrease in immigration which has characterized the latter half of the year. The general character of the passenger traffic, with which the officers of the service are called on to deal at Boston, may be described as follows:

Trans-Atlantic passenger travel.—Practically all the trans-Atlantic passenger travel to Boston at present comes from the European seaports of departure, and by steamship lines mentioned below:

From Glasgow and Moville (Londonderry, Ireland), by the Allan line; from Liverpool, by the Leyland Line; from Liverpool and Queenstown, Ireland, by the Cunard Line; from Liverpool and Queenstown, Ireland, by the White Star Line; from Antwerp, by the Red Star Line; from Genoa, Naples, Palermo, and the Azores, by the White Star Line; from Genoa, Naples, Palermo, the Azores (and once from Madeira Islands), by the Navigazione Generale.

Other passenger travel to Boston.—Besides the trans-Atlantic passenger traffic there is a regular travel to Boston from Central and South American ports and the West Indies.

There is also a very large passenger travel from British American ports amounting to more than the total trans-Atlantic passenger movement, but as ships and passengers from the British American ports are examined at the foreign port of departure they are not enumerated or otherwise considered in this report.

The 65,778 passengers arriving on the 383 passenger ships subject to local inspection by officers of the service, were divided with respect to citizenship and classification on shipboard, as shown below (Table A):

TABLE A.

Class.	Number of citizens.	Number of aliens.	Total passengers.	Proportion of United States citizens.
				Per cent.
First cabin	4,978	1,324	6,122	78
Second cabin	3,521	12,297	15,818	22
Steerage	2,691	41,122	43,813	6
Stowaways	9	16	25	
Total	11,019	54,759	65,778	17

From this table it is to be observed that the ancient practice of regarding steerage passengers and immigrants as synonymous is without justification under present conditions of ocean travel. For the entire year 6 per cent of the steerage passengers arriving at Boston were United States citizens, and over three-fourths of the second-cabin passengers were aliens. United States citizens, whether arriving in the steerage or cabin, are not subject to the medical examination prescribed by the immigration laws, and are ordinarily not even seen by the medical officer detailed for such duty. It is also to be noted that about 25 per cent of the aliens arriving at Boston come as cabin passengers, and their proper medical examination is often made exceedingly difficult from the fact that a long-established custom dictates that the medical inspection of cabin passengers must be made somehow on shipboard whenever they may arrive, day or night, and that they can not be removed to a suitable place ashore for the purpose, as is done in the case of the steerage passengers.

The relative proportion of aliens in the cabin and steerage receiving medical certification on arrival is shown below (Table B).

The number of alien passengers certified for "physical or mental defects and diseases" is shown in the following:

TABLE B.—*Distribution of certificates.*

Classification on shipboard.	Number of alien arrivals.	Class A and B certificates.	Class C certificates.	Total certificates.	Ratio certified.
First-cabin aliens	1,324	10	11	21	1 : 63
Second-cabin aliens	12,297	160	716	876	1 : 14
Steerage aliens	41,122	367	1,287	1,654	1 : 25
Total	54,743	537	2,014	2,551	1 : 21

From this table it will appear that over 7 per cent of the alien second-cabin passengers were certified as seriously defective or diseased, while only 4 per cent of the alien steerage passengers were so certified. Compared with the previous year, this indicates a slightly smaller proportion of steerage aliens and a slightly larger proportion of second-cabin aliens certified than the preceding year, thus emphasizing the fact noted in previous annual reports that diseased or defective aliens to-day tend to come in the cabin, so called, rather than in the steerage. The ratio of medical certifications to total aliens is almost exactly the same as it has been at this port for several years past. Out of a total of 2,551 aliens certified only 186, or about 7 per cent, were actually deported, and of the 186 deported 53 were deported for diseases which under the law render their exclusion mandatory upon the immigration officials. It was held either by the local immigration officials or by the secretary of the department on appeal that in all but 133 of the other cases certified the circumstances of the cases were such that the condition certified did not affect the alien's ability to earn a living or render him likely to become a public charge.

In considering the particular diseases calling for certification, it is to be noted that the number of cases of trachoma fell to the comparatively insignificant total of 24. Contrary to the experience of ports of entry taken as a whole, the number of cases of this disease found among aliens arriving at Boston has been diminishing rather than increasing. This is believed to be due to the perfected systems of examination at ports of foreign embarkation on the part of the steamship companies running ships to this port, and appears to coincide with the experience at other ports with passengers arriving by ships of the same lines. There is a marked falling off in the number of certifications for insanity and other mental defects as compared with the preceding year, but the cause is believed to be only accidental and temporary.

Five aliens were certified for uncinariasis, three Italians and two Chinamen. These cases were detected through the local routine practice of making a microscopical examination of the blood of every alien pale or anemic in appearance. Whenever an easinophilia is found a special examination is made for evidence of the presence of hookworms. Both this year and last uncinariasis has been found associated with such a slight degree of anemia as to suggest the probability that infection with this disease is comparatively common among immigrants from various districts and that it is constantly entering the country undetected.

There were no cases at all of cerebro-spinal meningitis on arriving ships, and as far as known none have occurred among recently arrived aliens who had entered at Boston. The only diseases of special interest which may be noted were two cases of Malta fever. Both were men suspected on line inspection of having a temperature and turned aside, the diagnosis being subsequently made in hospital.

BROWNSVILLE, TEX.

Acting Asst. Surg. George D. Fairbanks reports that the number of immigrants entering the United States through Brownsville during the past year has increased about 33⅓ per cent over the previous year. This is much lower than was expected, due to the nonuse of the new international bridge on account of the Mexican revolution.

The variety of diseases certified has increased considerably and includes another case of leprosy (one was certified last year). Eye diseases continue to furnish the greatest number of certifications, quite a few of which were observed in Syrians and in other foreigners. Most of the trachoma cases among Mexicans occur among the children, but it has been impossible to determine whether the disease is comparatively new among them or whether the adults have had it and recovered.

EL PASO, TEX.

Acting Asst. Surg. J. W. Tappan reports as follows:

During the year 24,434 aliens were inspected. Most of these were Mexican laborers, who, as a rule, are healthy and free from defects likely to interfere with their ability to earn a living. One hundred and sixty-three certifications were made to the supervising inspector of immigration for diseases or defects, physical or mental, as follows:

Under class A (instructions for the medical inspection of aliens), feeble-minded, 5; insane, 4; tubercle of lungs, 13; epilepsy, 2; syphilis, 4; trachoma, 5; leprosy, 2; gonorrhea, 12; uncinariasis, 10; all of which were deported.

Under class B, 101 certificates were issued, with 69 deportations and 32 admissions.

Under class C, there were 5 certifications, all being admitted.

These were inspected, however, for contagious diseases, and all those who had not evidences of having had smallpox, or a recent successful vaccination, were vaccinated.

For four months immigration was practically suspended, owing to the enforced discontinuance of railroad service to Jaurez, Mexico, from the interior, hence the small number of aliens inspected in comparison with former years.

A careful inspection and, in many cases, detention and thorough examination has proven that the percentage of aliens from Mexico afflicted with uncinariasis entering at this port is a very small one. While 10 cases were certified during the year, 8 of these were Hindoo immigrants who came direct to this port through Mexico and were afflicted with the Old World worm, while two were Mexican laborers who harbored the Necator Americanus. Uncinariasis, however, is quite common in the Southwest and is, no doubt, imported from the Mexican west coast and Lower California and from foci in our own States.

HALIFAX, NOVA SCOTIA.

Acting Asst. Surg. T. W. P. Flinn reports as follows:

During the year just ended 119 trans-Atlantic passenger steamships arrived at Halifax, bringing 47,209 passengers; for the United States, 4,637; and for Canada, 42,572.

The steamships of the Plant Line sailing from this port to Boston carried about 5,000 passengers.

The number of immigrants admitted to the Government detention hospital for the year ending June 30, 1911, for mental and physical defects were 353, of which number 179 were destined to the United States.

The Italian immigration to the United States through Halifax has practically ceased and the Russian immigration has largely decreased since last July.

The attention is called to the decrease of the number of immigrants certified for trachoma for the year just closed as compared with the number certified for the previous fiscal year.

There is no doubt that the stringent measures put in force by the United States Immigration Service and the assistance rendered by the Canadian immigration authorities at this port had a very deterrent effect with the steamship companies in embarking and bringing to this port aliens so afflicted.

The Asiatic passenger traffic to Halifax has been eliminated by the steamship companies so engaged on account of it becoming nonremunerative, as many of the Armenians, Persians, Syrians, Turks, etc., were found on their arrival to be afflicted with trachoma and other physical and mental defects which were a bar to their landing and called for their prompt deportation.

St. Johns, Newfoundland, has the past year become an entrance port for Syrians afflicted with trachoma, disembarking from the trans-Atlantic steamships calling at that port.

These Asiatics surreptitiously try and probably have entered the United States via Canada through Sydney, North Sydney, and other ports along the New Brunswick and Nova Scotian coasts.

The Canadian immigration authorities have been made aware of the above facts and have exercised vigilance and taken stringent measures to prevent the landing of these diseased Asiatics. It is probable that many of these Syrians afflicted with trachoma receive treatment at St. Johns, Newfoundland, as the period of their residence there is over a month or more.

Halifax is to have completed within the next 18 months a new and up-to-date immigration building. This building will be built of reenforced concrete, two stories high, and will be erected on a new concrete pier on the site of the old Cunard property now acquired by the Dominion Government. The dimensions of the building will be about 220 feet wide and 800 feet long. From information received the Canadian immigration bureau has promised that the quarters to be occupied by the United States Immigration Service will be spacious and furnished with the most modern improvements as to lighting, ventilation, and sanitary arrangements, with the point in view that the interior will be so designed as not only to contribute to the comfort of the immigrant, but will have all the facilities for the proper handling of the aliens. The Canadian Parliament has voted the sum of $600,000 before the House adjourned last May to enable the work to proceed.

NEW ORLEANS, LA.

Acting Asst. Surg. J. T. Scott reports through the medical officer in command as follows:

Out of 4,058 aliens examined at New Orleans, 135 were certified under classes A 1, A 2, B, and C. Of these there were deported 31; the others were released to relatives or other responsible parties or after treatment and temporary detention in local hospitals and other institutions.

The local situation, as far as the incoming alien is concerned, is perhaps different from that obtaining at other ports; the greater majority of aliens come to join relatives who are already established at New Orleans, and when aliens are certified, their friends or relatives come forward and give bond. Many cases of trachoma are landed in this way for treatment in local hospitals and are subsequently released.

A large number of aliens arrive from Central American and West Indian ports in transit, or on a short visit. This class of immigrants object to a medical examination of any kind. The situation might be improved if the transportation companies would assist to the extent of classifying their passengers. This they can not or will not do, claiming that owing to the short passage it would not pay them to give a steerage rate; and again many of their boats are too small to carry any but first-class passengers. As a consequence, it is necessary to examine all passengers alike. Only the Southern Pacific Co. and Italian line make a distinction between classes on vessels. The steamers from England carry only cabin passengers.

All arriving passengers are examined on the decks of the vessels, which is often difficult for all concerned, as well as distasteful, due to narrow passages and the lack of privacy. However, this will no longer be the case when the proposed new immigrant station is opened.

Most of the aliens arriving, except those from Central America and the West Indies, are destined to plantations, sawmills, and other places where labor is in demand. Some few are bound for the mining regions of Alabama and other States. A few go to Colorado and California and the fruit-growing districts of the West.

At present the demand for labor is not great, consequently the number of aliens arriving at New Orleans is relatively small.

NEW YORK (ELLIS ISLAND IMMIGRATION STATION).

Surg. George W. Stoner, chief medical officer, reports the following:

Seven hundred and forty-nine thousand six hundred and forty-two aliens were examined upon arrival, including 180,213 cabin and 569,429 steerage passengers. Besides these there were 182,722 passengers (154,637 cabin and 28,085 steerage) who, upon further examination by the immigrant inspectors, proved to be citizens of the United States.

Sixteen thousand nine hundred and ten aliens were certified for physical or mental defects, including 209 mentally defective, viz, idiot 11, imbecile 24, feeble-minded 94, epilepsy 10, insane 70, and for tuberculosis 34.

Under the classification of loathsome contagious or dangerous contagious there were 1,363, including trachoma 1,167, favus 68, tinea tonsurans 54, gonorrhea 23, sycosis barbae 23, venereal ulcer 14, syphilis 10, tinea unguium 2, uncinariasis 2.

Eleven thousand and seventy-two were certified for disease or defect which affects ability to earn a living, including senility 5,573, hernia 1,286, lack of physical or poor muscular development 883, varix 350, valvular disease of heart 273, curvature of spine 206, defective vision 182, inflammation of lymph glands of neck 157, malnutrition 148, goiter 55, arteriosclerosis 51, deafness 39, and numerous other affections, and 4,232 were certified for disease or defect of less degree.

Six thousand and forty-three aliens were admitted to immigrant hospital, Ellis Island, during the fiscal year, including men 3,273, women 1,559, male children under 12 years of age 671, female children under 12 years of age 540, and there were 98 patients in hospital at the beginning of the fiscal year, making a total of 6,141 furnished hospital care and treatment. Of these 347, including 132 landed (public charge), aliens were mentally diseased.

There were 19 men, 5 women, 12 male children, and 4 female children (total 40) who died in the immigrant hospital during the year. Thirteen (8 male and 5 female) were born.

In addition to the foregoing, 720 arriving aliens, including 64 remaining from preceding year, viz, measles 285, scarlet fever 70, meningitis 32, diphtheria 17, chickenpox 6, rubella 1, miscellaneous or mixed affections 42, and 203 accompanying persons, were transferred from Ellis Island to the care of the State quarantine hospital at entrance of harbor, pursuant to official agreement, pending the opening of the contagious disease hospital at Ellis Island for the reception of patients. One hundred and one died, viz, measles 66, scarlet fever 12, meningitis 16, pneumonia 4, diphtheria 3, and there were 9 aliens remaining under treatment July 1, 1911. Besides these, according to the health officer's report, there were removed at the entrance of harbor direct from ships to quarantine hospital during the year 2,188, including 241 remaining from preceding year, viz, measles 552, scarlet fever 58, chickenpox 50, diphtheria 11, mumps 5, cholera 5, smallpox 4, and miscellaneous affections 162, for observation 320, accompanying persons 745. Of these 163 died, including measles 86, scarlet fever 11, diphtheria 6, smallpox 3, cholera 2; and there were 72 remaining under treatment at the close of the fiscal year.

Besides the number of aliens admitted to immigrant hospital and the number transferred or directly admitted to the State quarantine hospital, 146 requiring immediate attention on arrival at the docks were cared for by the different steamship companies during the year in hospitals of their own selection in the city. Of these 12 died.

One hundred and sixty-eight alien immigrants who had become public charges or inmates of State or local hospitals or institutions in New York, New Jersey, and Connecticut were visited and examined during the year by medical officers attached to this station to determine the nature of the disease, mental or physical, from which the aliens were suffering, and whether or not due to causes existing prior to landing in the United States; and a medical certificate in each case was rendered for the information of the Commissioner of Immigration.

The primary medical inspection line, medical examination rooms, and all accommodations pertaining to the medical office on second floor, main building, were discontinued as such May 11, 1911, and transferred to the new and more commodious and appropriate quarters especially designed for the purpose on the first floor, and placed at the disposal of the medical office by the commissioner.

The new immigrant contagious disease hospital was opened for the reception of patients June 20, 1911, and since then all aliens arriving at Ellis Island found to be afflicted with such disease have been admitted to and cared for in said hospital.

PORTAL, N. DAK.

Acting Asst. Surg. Arthur J. Somers states that a very large percentage of the aliens examined at the port of Portal, N. Dak., are Canadian citizens of the robust type of laborers or those engaged in agricultural pursuits seeking locations in the Northwest States, and these classes of aliens are, as a consequence, particularly free from mental or physical defects. The recent arrivals from European countries, having undergone numerous medical examinations by the Canadian authorities, etc., are for the most part in good health and free from mental or physical defects when they arrive at the port of Portal.

QUEBEC, CANADA.

Acting Asst. Surg. C. A. Bailey reports as follows:

During the fiscal year (from June 30, 1910, to Nov. 23, 1910, and Apr. 26, 1911, to June 30, 1911) 223 ships arrived at the port of Quebec, bringing passengers destined to the United States, as follows:

Aliens examined (504 first, 2,984 second, 14,352 steerage)	17,840
Aliens passed	17,439
Aliens passed against whom were records of minor defects	131
Aliens detained (26 cabin, 244 steerage)	270
United States citizens (2,456 first, 3,621 second, 1,171 steerage)	7,248

The first and second cabin passenger inspection is conducted by the service officer on shipboard immediately upon the ship's arrival, unless it is after 6 o'clock p. m., when it is postponed until 6 o'clock the following morning; this to allow the ship with its cabin passengers to proceed to Montreal. The steerage passengers disembark at Quebec and are examined in a building furnished the United States Immigration Service by the transportation companies. The Canadian immigration department is contemplating the erection of a modern administration building, of about 700 feet in length by 80 feet in width, in which a space of 140 feet by 80 feet is to be set aside for the United States Immigration Service, when the medical officer will probably be given better facilities for the conduct of the medical examination. Aliens who are held for further observation or treatment or for acute maladies other than quarantinable diseases are sent to the Dominion immigration hospital at St. Malo, about 3 miles from the immigration station, where they are regularly visited by the medical officer of the service.

In the annual report for the fiscal year ended June 30, 1910, mention was made of the arrival at Quebec of a Russian immigrant on the steamer *Royal George* during November, 1910, who presented at the time of the examination on the line symptoms so suspicious of cholera that the medical officer, Acting Asst. Surg. C. A. Bailey, advised the return of the vessel, together with the sick Russian and the other passengers and personnel, to the quarantine station.

A bacteriological examination of material from this case was made by Prof. Adami, of the McGill University, with the result that the case was pronounced one of Asiatic cholera.

The presence of cholera spirilli was demonstrated in the stools of this immigrant for several months after his transfer to the quarantine station at Quebec (Grosse Isle).

The port of Quebec was closed as usual the latter part of November for the winter season and the medical officer was detailed to St. John, New Brunswick.

SAN FRANCISCO, CAL.

From the report of Passed Asst. Surg. M. W. Glover the following is taken:

During the fiscal year ended June 30, 1911, 10,353 aliens were examined by the officers on duty at this station and 1,012 certified for disease or physical defect. In addition, 282 vessels were boarded and 4,502 alien crew examined.

A marked decrease in the number of trachoma certificates is noted; the percentage for the year previous (1909–10) was five, while for the year ending June 30, 1911, it was eight-tenths of 1 per cent.

During the year it developed that a great number of the aliens arriving from the Orient brought with them uncinaria. The highest percentage of cases examined was found among the Hindus, and, as a matter of fact, the exclusion of these on the certificate of uncinariasis was a large factor in stopping the influx of the East Indian into this country. Next to the Hindu came the Japanese in numbers afflicted, then the Chinese. Summarized, the results of the examination for uncinaria ova are as follows:

Race.	Examined.	Infected.	Per cent.
Hindu	218	143	65.6
Japanese	528	290	54.1
Chinese	782	230	29.4
White	25	3	12
Total	1,553	666	42.8

Both the anchylostoma duodenale and the necator Americana were found in the Chinese and Japanese. In the Hindus the anchylostoma alone was identified. Owing, however, to the lack of time and assistants it was found imposible to carry out any complete examinations of cases, and in only a few was any attempt made to recover and identify the parasites passed. There is here an excellent opportunity for study of intestinal parasites as the supply of material is large and constantly new.

As to the geographical and social condition of those infected, the Hindus were almost wholly unskilled laborers and came for the most part from the Punjab, principally from the neighborhoods of Jalander, Harshiarpur, and Ludhiana. There were five Afghans among those infected. As they had been some time in Hongkong, it is not possible to say where they acquired the infection.

The Japanese were almost wholly women ("picture brides") and for the most part country girls. They came principally from the kens of Fukuoka, Kumamoto, Hiroshima, and Tottori.

The Chinese came from the Province of Kwang-tun, whence, as a matter of fact, all Chinese immigrants to this country come, and the greater number from Sun Ning and Hoi Ping. There were very few women among them. The immigration of Chinese women is small and, many of these being bound-footed, were not examined for uncinaria, as the chances for infection in these cases would be very small.

Sixteen aliens, 15 Chinamen (1 of whom proved subsequently to be native born) and 1 Japanese, were certified during the year for filariasis. These presented only slight enlargement of the lymphatic glands.

Six cases of venereal diseases, 89 of trachoma, 2 of pulmonary tuberculosis, 636 of uncinariasis, 1 of amebiasis, and 3 of insanity were certified during the year.

In the immigration hospital during the year there were 1,985 patients, 21 of whom were remaining from the previous year. At the end of the year there were 26 still in the hospital. The number of days hospital relief furnished was 9,328, included in which was 297 days of free patients.

There were three deaths during the year, all Chinese, one each from lobar pneumonia, carcinoma of the rectum, and beri-beri. The first two were practically moribund when received at the station.

There were 206 Japanese women, 7 Japanese men, 119 Chinamen, and 3 Chinese women treated for hookworm during the year, 10 of whom were in the hospital at the end of the year under treatment. In addition, there were 2 Hindus and 1 white man treated. These came from Central American ports.

These cases were treated with thymol or the chloroform-castor oil mixture. The majority were cured in one or two treatments. In fact, the most of these cases could be regarded rather as hookworm carriers than as cases of uncinariasis. The Japanese women seldom present any marked evidences of the infection beyond a slight anemia, most noticeable in the conjunctivæ, as their lips are usually artificially reddened. The most marked evidences of infection have been observed in the Chinese boys. The recognition of the infection has explained what puzzled many at this station, and that was the apparent discrepancy in some cases between the apparent age of the Chinese boy and the age claimed.

Several changes were begun in the hospital building the latter part of the year which will, when finished, relieve many embarrassments.

The medical division here has experienced universal courtesy from all the other divisions at this station, and it has only been through their cooperation that the amount of work accomplished was made possible.

ST. JOHN, CANADA.

Acting Asst. Surg. C. A. Bailey reports as follows:

During the fiscal year (from Nov. 24, 1910 to Apr. 24, 1911) 49 ships arrived at the port of St. John, bring passengers destined to the United States as follows:

Aliens examined (17 first, 225 second, 2,988 steerage)	3,230
Aliens examined and passed	3,159
Aliens passed against whom were records of minor defects	29
Aliens certified and detained (steerage)	42
United States citizens (28 first, 37 second, 120 steerage)	185

DOMESTIC (INTERSTATE) QUARANTINE.

PLAGUE-SUPPRESSIVE MEASURES.

Plague-suppressive measures in California and near-by States were carried out during the fiscal year in accordance with the following plan, which was outlined in the annual report for the fiscal year ended June 30, 1910.

1. Destruction of known foci of infection.
2. Determination of new and unknown foci of infection, to the end that the extent to which the infection had spread, be made known as soon as possible.
3. General squirrel eradication.

The first two subdivisions were handled by the service, the last was handled by the service and the State of California combined, but under the direction of the service.

The general plan of operations thought best was as follows:

The State was divided into three subdivisions—a northern district, a central district, and a southern district—all under the direction of Surg. Rupert Blue.

The chief efforts were directed toward the discovery of new foci of infection, for the purpose of determining and outlining the limit to which the infection had spread, and the work under way continued, viz, the creating of squirrel-free zones around the cities of San Francisco, Oakland, Alameda, Berkeley, and vicinity, and such work as was necessary to show whether or not plague had reappeared, or was likely to appear, among the rats of the above-mentioned cities.

The work outside of the cities was organized on the basis of five men to each county, these men worked out from railroad and freight yards as centers, and paid particular attention to such points on the State line as the railroads cross, for the purpose of learning whether or not infection had extended into adjoining States. As soon as infection had been demonstrated in several different places within a particular county, the entire county was considered as infected, and the force was moved to another county.

Scouting parties were sent into Arizona and Nevada and into the territory north of San Francisco Bay and west of the Sacramento River, and began operations around freight yards, freight transfer points, and other strategical points, for the purpose of learning whether infection had been carried into those sections.

As soon as the area of infection was definitely defined the State of California and county boards of supervisors were asked to appoint as large a number of inspectors as possible to act in conjunction with and under the direction of the service for the purpose of eradicating all squirrels and other rodents within the limits of the infected area, and for a reasonable distance outside. The State and country inspectors are used, more particularly, to direct the efforts of farmers, ranchers, and landowners generally, to the end that an organized, systematic and coordinated campaign of rodent extermination may be carried out.

The following, which is largely taken from the report of Surg. Rupert Blue, indicates the manner in which the measures as above outlined have been carried out.

The antiplague operations of the service in the State of California were conducted through two divisions, namely:

1. The San Francisco division, having charge of the sanitation of the city of San Francisco.

2. The California division, comprising the several branches of field work in the interior of the State. Under the latter have been placed the operations in connection with the spread of plague among squirrels, the maintenance of squirrel free areas around the bay cities, the investigation to determine the extent of plague infection, and the joint Federal and county inspection service. This division also had charge of the small force of trappers employed in the cities of Oakland and Berkeley. The headquarters for both divisions, and the Federal laboratory, are located in San Francisco.

One case of plague occurred on August 23, 1910, at Coyote, a small station in Santa Clara County 11 miles from San Jose. The patient, a white girl (K. D.), aged 18 years, was taken to San Jose where she was isolated and treated in a hospital, the attack terminating in recovery. Although the source of the infection could not be positively traced, it was more than likely received from an infected ground squirrel, a number of which had been found on ranches in the vicinity of the patient's home.

MEASURES IN SAN FRANCISCO.

There have been no cases of plague, either human or rodent, in the cities of San Francisco, Oakland, Berkeley, or Alameda in the past year. Routine work, consisting of rat destruction, sanitary inspection, and the enforcement of the rat ordinances, have been continued in San Francisco. As a result the rat population has been reduced and maintained at the lowest level yet reached in the sanitation of the city. Rats are still being trapped in all sections and examined bacteriologically for evidence of plague infection.

This procedure is necessary in view of the close proximity of plague foci in other parts of the State, and because it will enable the medical officers to detect the disease among rodents in time to adopt protective measures before the occurrence of human cases. Moreover, it has been established as a principle in this country that certain post-epidemic measures should be continued almost indefinitely after the last plague case has been found.

The following is a partial summary of the operations of the year in San Francisco:

Number of rats trapped	70,202
Number of rats found dead	2,083
Number of mice trapped	17,475
Number of poisons placed	1,159,190
Number of squirrels trapped in suburbs	256
Number of gophers trapped	178

Rodents Identified.

Mus norvegicus	58,856
Mus rattus	7,155
Mus alexandrinus	6,274
Mus musculus	17,475
Thomomys bottæ	173
Citellus beecheyi	256

Plague infected, none.

Measures Taken for the Destruction of Rat Pabulum.

Number of premises inspected	52,541
Number of nuisances abated	6,497
Number of complaints investigated	2,537
Number of garbage cans installed	1,252
Number of chicken yards abandoned	263
Number of chicken yards concreted (area in square feet, 5,785)	64
Number of chicken yards disposed of	2,004
Number of premises screened	682
Number of toilets screened	54
Number of health signs posted	670
Number of notices served	3,308
Number of plumbing complaints referred	240

Condemnations of Insanitary Buildings Secured Through the Board of Health.

Number of buildings reported as insanitary	1,211
Number of buildings condemned at hearings	1,016
Number of insanitary buildings abated without hearings	774
Number not acted upon	242

Concrete Work Done (Old Premises), Dwellings, and Stores.

	Number concreted.	Area in square feet.
Basements	331	278,113
Floors	105	168,138
Yards	126	80,685
Passageways	70	19,693
Sidewalks	78	36,800
Total number of square feet laid in old premises		583,429

Concrete Work Done (New Premises), Dwellings, and Stores.

	Number concreted.	Area in square feet.
Basements	176	257,675
Floors	38	74,100
Yards	19	18,355
Passageways	9	4,420
Sidewalks	24	13,360
Total number of square feet laid in new premises		367,910

The health conditions of the city of San Francisco were never better than they are at the present time. Ordinances to prevent the contamination of milk and other foodstuffs and the notification of cases of tuberculosis were uniformly enforced by the local health board. Gratifying progress was made in school hygiene and in doing away with flimsy, wooden structures, the makeshifts of the reconstruction period. The effectiveness of these measures is shown in reduced morbidity and mortality rates for tuberculosis, typhoid fever, and the communicable diseases generally.

MEASURES IN OAKLAND AND BERKELEY.

Systematic trapping has been carried on in these cities throughout the year. The supplies, traps, bait, and shelter for the same were supplied by the city council, while the service directed the work and paid the salaries of trappers. The branch laboratory, which had been maintained in Oakland since the campaign of 1908, was closed in November, 1910, and the equipment moved to the San Francisco Laboratory. A case suspected of being plague occurred in a Chinaman at one of the hospitals, but on investigation it proved to be acute parenchymatous nephritis.

The following is a summary of the operations of the year in Oakland:

Number of rats trapped	31,477
Number of rats found dead	901
Total	32,378

Rodents Identified.

Mus norvegicus	28,020
Mus musculus	4,243
Mus rattus	78
Mus alexandrinus	37
Total examined	25,949

Plague infected, none.

The following is a summary of the operations of the year in Berkeley:

Number of rats trapped	5,810
Number of rats found dead	0

Rodents Identified.

Mus norvegicus	4,357
Mus musculus	1,424
Mus rattus	2
Mus alexandrinus	27
Total examined	1,193

Plague infected, none.

MEASURES IN LOS ANGELES.

A branch laboratory, with an inspector in charge, was maintained in Los Angeles for the pathological examination of rodents collected in southern California. This was necessary in view of the long haul to the San Francisco laboratory and because of the fact that specimens are liable to undergo decomposition in hot weather if kept too long en route. This work is to be discontinued in the near future, and all equipment will be forwarded to San Francisco.

A summary of the operations in the southern part of the State included the following: Number of squirrels collected, 23,761; squirrels examined, 21,932; squirrels infected, none.

SQUIRREL FREE ZONES FOR THE PROTECTION OF CITIES.

In the annual report for 1910 reference was made to the creation of a squirrel free zone around the cities of Berkeley and Oakland. This work has been extended and protection afforded the entire bay shore from Point Pinole to Decoto and the Coyote hills. A similar area, designed to protect San Francisco from the south, has been cleared on the peninsula as far as the San Mateo County line. These areas should be maintained in a free condition until the landowners have had time to destroy all squirrels in the rear of the position. At the present rate of progress this will require many years of intelligent labor. That this work was effective in preventing the reinfection of rodents of the bay cities can be well claimed, when it is remembered that foci of squirrel plague were found within a short distance of suburban residences in Oakland and Berkeley.

MEASURES IN RURAL CALIFORNIA.

Squirrel Campaign.

The investigation for the detection of new foci of rodent plague has been extended and rodent specimens obtained in 45 counties of California, parts of Nevada, Arizona, and Oregon. This completes the preliminary work of determining the extent of the area of infection, and it is believed that the boundaries of the same have been accurately defined. This area lies in the central and coast counties of the State, and extends from the Carquinez Straits on the north to San Luis Obispo County on the south, a distance of 180 miles.

Prior to December, 1910, it was thought that the San Joaquin River formed the eastern boundary of the infection. The San Joaquin River is a wide river and extensive swamps exist on both sides for the major part of its length. Squirrels do not live in swampy ground, and it was thought that a natural barrier to the spread of infection among squirrels existed. In December, 1910, however, infected squirrels were shot near Ripon, some 15 or 20 miles east of the river, and since then others have been found one or two miles north of Modesto, in Stanislaus County.

NEW FOCI OF INFECTION.

The epizootic has been followed into new territory south and east of the limits reported last fiscal year. New foci have been found on a ranch three miles south of San Benito, and eight miles south of Los Banos, in Merced County. No evidence of plague infection has been discovered in San Luis Obispo County other than the single squirrel found January 29, 1910, although searching investigations have been made in the northern and central portions of the county.

For two years past a diligent search has been made for foci in southern California in the counties of Los Angeles, San Bernardino, Riverside, Imperial, San Diego, Orange, Ventura, and Santa Barbara, and not a single case of infection either human or rodent has been found. In view of these facts it has been deemed advisable to discontinue the inquiry in the country south of the Tehachapi Mountains and to concentrate the force on the coast and in the San Joaquin Valley, in the central part of the State, where infection has been found, and through which it will have to pass in order to reach the eastern States.

PASSES IN THE SIERRA NEVADA MOUNTAINS.

It has been noted that the squirrel range (Citellus) is not broadly continuous between the San Joaquin Basin and the eastern section of the State.

Except through certain passes, to be mentioned later, the Sierra Nevadas are impassable for squirrels and they have not been found at a greater elevation than 8,000 feet. Connecting links, however, are supplied above this elevation by other rodents such as certain species of Neotoma (wood rat) and Lepus (rabbits) which abound in high altitudes on both sides of the mountains. As both of these animals are susceptible to plague infection it can be readily seen that it is possible for the disease to be conveyed across the mountains to the rodents of Inyo and Mono counties and thence into the State of Nevada. In addition to the above, there are other means by which it is possible for the infection to spread beyond the confines of the State of California. There are certain passes in the Sierra Nevada mountains whose altitudes are lower than 8,000 feet, the highest point at which squirrels have heretofore been found, and reports have been received from hunters and from members of the Biological Survey of the Department of Agriculture that squirrels are fairly numerous in these passes, thus forming connecting links between the rodents on the western and eastern side of the Sierras. The first of these passes is in the vicinity of Truckee and is traversed by the Southern Pacific Railroad; the second pass extends through the mountains south of the Truckee Pass and a wagon road connecting Folsom, Cal., with Carson City, Nev., passes through it. The third pass is Walker's Pass, a natural roadway through the mountains, which connects Kern County with the San Bernardino section on the eastern or desert side. Hunters have reported that squirrels are fairly numerous in this pass and that it serves as a "spillway" for small mammals in passing from one section to another. The fourth pass is known as the Tehachapi Pass and is traversed by the Southern Pacific Railroad on its way to the south.

The pass situated nearest to a focus of plague infection is the one from Folsom to Carson City. Its western end is not far removed from the foci of infection at Ripon and Modesto.

In order to prevent the spread of the disease from the foci east of the San Joaquin River situated at Ripon and Modesto, a squirrel-free zone is being established in the counties of San Joaquin and Stanislaus in such manner as to limit the infection to its present location pending its final elimination.

COUNTIES INFECTED.

There have been received during the year 126,125 ground squirrels, 55 of which proved to be plague-infected. The infected animals were received from the following counties, namely: Alameda, Contra Costa, Merced, Santa Clara, San Benito, Stanislaus, and San

Joaquin. In addition to the above-mentioned animals, the hunters collected and sent in the following: Rabbits, 1,778; gophers, 384; field mice, 94; kangaroo rats, 36; chipmunks, 75; and weasels, 75. None of these animals were found infected.

Counties at present and heretofore infected.—Since the beginning of plague-suppressive measures in California in September, 1907, infection has been found in a total of twelve counties, namely: San Francisco, Alameda, Contra Costa, Merced, Santa Clara, San Benito, Stanislaus, San Joaquin, Santa Cruz, Monterey, San Luis Obispo, and Los Angeles. No infection has been found in the counties of San Francisco or Los Angeles since 1908, and no infection in the counties of Santa Cruz, Monterey, and San Luis Obispo during the past fiscal year. So far as the counties of San Francisco, Los Angeles, and San Luis Obispo are concerned, in view of the extensive investigations which have been carried on, it is believed that it can be reasonably assumed that no infection exists therein. The same can not be said of the counties of Santa Cruz and Monterey. It is true that no infected squirrels have been discovered in these two counties during the past fiscal year, but this was due to the fact that the investigations in those counties were not particularly extensive, the chief efforts being in the counties east of the coast range of mountains and on the southern border of the infected area. Since the close of the fiscal year, one infected squirrel was found in Monterey County. Date of discovery, August 6, 1911.

JOINT FEDERAL AND COUNTY INSPECTION SERVICE.

GENERAL SQUIRREL ERADICATION.

In the fall and winter of 1910 the State Board of Health issued a circular letter to county boards of supervisors calling their attention to the State law entitled " An act for the extermination of rodents," and requesting their cooperation in the enforcement of the same. Following this notification by the State Board, Surg. Blue visited a number of counties and addressed the supervisors on the importance of controlling the infection, and offered Federal aid if the boards would join in a general movement for the eradication of the squirrel. In most instances the offer was accepted without hesitation, but in a few counties action was delayed until later in the season.

The plan which was finally accepted by the counties consisted of—

1. The adoption of a resolution declaring ground squirrels a menace both to the health and commercial interests of the State, as follows:

Resolution of County Board of Supervisors.

Whereas, the State Board of Health and the United States Public Health and Marine-Hospital Service have conclusively shown that plague exists among the ground squirrels of (this and other) counties of the State of California; and

Whereas, the State of California has enacted a law entitled "An ct for the extermination of rodents;"

Therefore be it resolved, That rodents are a menace to the public health and commercial prosperity of this county and State, and the public are therefore requested to immediately take measures to destroy all rodents found upon their premises; and be it further

Resolved, That the Federal Government be requested to detail experienced men to assist the board of supervisors in exterminating the squirrels in ——— County.

2. The appointment of county inspectors for duty in connection with the enforcement of the law.

3. The detail of Federal inspectors, one for each county, to take charge of the inspection service. Each county inspector was assigned to a definite territory, usually a supervisorial district, and charged with the duty of serving a formal notice upon owners and tenants of property therein, as follows:

No. —. NOTICE.

No. —. ———, —, 191—.
To------------------------------
Address------------------------------
Location of property------------------------------

Time expires------------------------------
------------------------------191—
Remarks------------------------------

———, *Cal.*, ———, —, *191—*.
——— ———,
———, ———.

You are hereby informed and notified that the property (premises) owned, occupied, or controlled by you in ——— has been inspected and found to be infested with rodents in violation of an act of the California Legislature of March 13, 1909, entitled, "An act for the extermination of rodents."

You are notified to abate this nuisance and to place your premises in condition required by law within —— days.

——— ———,
Inspector.

From 20 to 30 days were given for compliance with the provisions of the act. After the expiration of this time, if due diligence had not been shown by the party in charge, his name was sent in to the district attorney for such action as considered necessary. Having covered the district thoroughly, the inspector was required to go over it again, with a view to ascertaining the results of the first inspection and to secure the names of the delinquents. Circulars, stationery, and printed forms of all kinds were furnished by the boards of supervisors.

The Federal inspectors were trained men and capable of giving expert advice as to the best and most inexpensive methods employed in squirrel extermination. As was to be expected, the original plan could not be carried out in all cases. Some counties could not afford a full quota of inspectors—that is, one for each supervisor's district—and in others the rough topography of the country made the employment of extra men necessary. Federal inspectors were detailed to fill out the required number. The results have been very satisfactory, and farmers generally have shown a great interest in the work, devoting much time and money to squirrel poisoning.

It is more than likely, however, that difficulties and delays will arise later in clearing grazing lands, watersheds, remote tracts, and the holdings of absentee landlords. Trouble has already arisen in connection with infested Federal lands. Private owners claim that it is both a waste of time and money to exterminate squirrels on lands adjoining the national parks and forest reserves. It is stated that these possessions of the National Government are alive with rodents, and that during certain seasons, ground squirrels migrate in large numbers from them to the ranches and farms in the lower valleys. In view of this fact, the farmers in certain localities have refused to touch the problem until some eradicative work has been done on unoccupied portions of the public domain.

FOREST RESERVES AND NATIONAL PARKS.

In April, 1911, inspectors appointed by the supervisors of Tulare County reported to Surg. Blue that the larger portion of the public lands in California was infested with ground squirrels, and stated that the farmers and ranchers could not comply with the act of the California Legislature, entitled "An act to exterminate rodents," approved March 13, 1909, on account of the fact that the Government lands adjoining private lands served as a breeding ground for squirrels, and that squirrels migrated from public lands to the private lands adjoining. This was followed later by resolutions passed by county boards of supervisors, which reiterated the above statement and requested the cooperation of the Departments of the Interior and Agriculture in the extermination of rodents on lands under their respective jurisdictions. Upon the receipt of the information above outlined, the Secretary of the Treasury addressed letters to the Secretaries of Agriculture and Interior outlining the situation and requesting their cooperation to the extent of causing the destruction of squirrels on land under their control. Letters were received from the Secretaries of both departments which stated, in effect, that instructions would be sent to the persons in charge of forest reserves and national parks to cooperate in this work so far as authority in law and appropriations would allow. This work is now under way.

COUNTIES INVESTIGATED.

In May, 1911, it became necessary, owing to the inauguration of the joint Federal and county inspection service, to detail a medical officer for duty in the San Joaquin Valley, with headquarters at Fresno. The work of eight counties in the valley was supervised from this central point.

The following-named counties have joined the movement, and an active campaign is now being waged therein: Contra Costa, Alameda, Santa Clara, Santa Cruz, San Benito, Stanislaus, Monterey, Merced, Mariposa, Fresno, Kings, Tulare, and Kern.

The counties of San Joaquin, San Luis Obispo, Calaveras, Madera, and Tuolumne will undoubtedly take up the work in the near future.

Rodent specimens have been obtained from the following-named counties:

California.—Alameda, Amador, Butte, Calaveras, Colusa, Contra Costa, El Dorado, Fresno, Glenn, Imperial, Kern, Kings, Lake, Los Angeles, Madera, Mariposa, Mendocino, Merced, Monterey, Napa, Nevada, Orange, Plumas, Riverside, Sacramento, San Benito, San Bernardino, San Diego, San Joaquin, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Siskiyou, Solano, Sonoma, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Ventura, Yolo, Yuba.

Nevada.—Douglas, Ormsby, Washoe.

Oregon.—Jackson.

DISPOSITION AND DUTIES OF THE FORCE.

Although the authority to enlarge the field of squirrel eradication was granted in the fall of 1910, the number of employees was not materially increased until April and May of 1911. This was due, in the main, to the advent of the rainy season and to the fact that desirable men were not available at the time. During the months of May and June, 1911, the force was rapidly increased to 185 men, and many of these, after undergoing a period of training, were selected as hunters and sent into northern California, southern Oregon, and western Nevada.

Employees, before being sent to the field, were given a course of instruction and required to qualify as experts in the several branches of the work. All received the course at the camp in the squirrel free zone on the Oakland side.

A serious obstacle arose in connection with the prosecution of work in certain remote sections of the State. Subsistence for the men was not to be had, and it was not practicable to forward supplies of various kinds to points at great distances from the railroads. In order to overcome the difficulty, five mobile companies were organized, trained, and placed in the field. Each company consists of six men and is supplied with a covered wagon, tents, kitchen utensils, and all necessary equipment for living out of doors. These companies will be used to combat the natural conditions favoring the spread of infection, and will be dispatched to strategic points in the field of operations such as are found at Ripon and Modesto.

Method of procedure on locating a focus of infection.—The hunter who sent in the specimen was directed by letter to obtain the names and addresses of owners and tenants residing in the infected locality. Letters were then mailed to these owners and tenants informing them of the existence of bubonic plague in their neighborhood and advising the immediate destruction of all rodents found therein. A circular of information relating to the methods employed by the service was inclosed. The method of treating new foci, or rather foci found beyond the known limits of the infected area, differed somewhat from the foregoing. Hunters were assembled from the contiguous districts, and a systematic effort was made to blot out the colony, fleas and all, in which the specimen was obtained. The work consisted in the distribution of poison, and the permanent closure of burrows in and contiguous to the infected colony. During the rainy season distillate or carbon bisulphide will be used to burn out the holes.

LABORATORY REPORT.

The work at the Oakland laboratory which was consolidated with the San Francisco laboratory on November 1, 1910, is included. This report will be divided into the following sections: Routine work, research, educational and exhibits, and personnel.

ROUTINE WORK.

Investigations for detecting human plague.—Several autopsies have been attended and a number of sick have been seen for the purpose of determining the presence or absence of plague infection. The autopsies were all negative, and only one of the living suspects was found to be suffering from plague. This was a girl infected near Gilroy, Santa Clara County, Cal. She was seen at the hospital in San Jose, in conjunction with Dr. William Simpson, the health officer, and Dr. C. A. Wayland, the physician in whose practice the case occurred. The case was a typical one, although rather mild. No difficulty was experienced in making the clinical diagnosis, which was confirmed bacteriologically.

Examination of rodents.—The routine dissection of rodents has been carried on as in previous years. The figures in the following table show the number of animals examined and the number infected with plague:

	Examined.	Infected with plague.
Ground squirrels	124,265	55
Rats	92,923	
Gophers	384	
Rabbits	1,778	
Weasels	75	
Chipmunks	75	
Mice	94	
Field mice	7	
Kangaroo rats	36	
Badgers	4	
Moles	3	
Wood rats	6	
Wildcats	2	
Tree squirrel	1	
House cat	1	
Coyote	1	
Total examined	219,655	55

In the case of practically every animal reported as plague infected we have isolated the plague bacillus in culture, either directly from the squirrel or from a laboratory animal inoculated from this rodent. Important points in connection with the pathology of plague in naturally infected ground squirrels have been made the subject of a separate report, which was published as part of Public Health Bulletin No. 43, Public Health and Marine-Hospital Service.

RESEARCH.

Plague.—Work has been continued upon the study of plague immunity. The results have not lead to the discovery of any new facts. So far as our present knowledge goes, the only way that a reasonably lasting immunity to plague may be effected is by the inoculation of living avirulent cultures of the bacillus.

In conjunction with Prof. Hans Zinsser, of Stanford University, Palo Alto, Cal., we have undertaken a number of experiments for the purpose of determining the influence of leucocytic extract as an immunizing agent against plague. It was found that when rats were inoculated simultaneously with the extract derived from the leucocytes of the rabbit and with a virulent culture, a considerable percentage of them were saved. It is too early to predict whether this method is to have a place in the treatment of human cases.

We have recently undertaken a large series of experiments to determine the virulence of old plague cultures from rats, and those that have been isolated from ground squirrels since the beginning of the work. The cultures are all quite virulent. Even those that have been in the laboratory for three years or more have lost very little of their capacity for infecting laboratory animals.

An experiment has been carried out to determine the susceptibility of hogs, calves, sheep, and goats. We have not succeeded in killing any of these animals with the plague cultures, but we have shown that some of them carry the organism at the site of inoculation for a considerable period without apparently suffering any ill effects from it.

The subject of insect transmission of plague has been given some attention. The results have been embodied in the report previously referred to (Public Health Bulletin 43, Public Health and Marine-Hospital Service).

Plague-like disease.—Work on this has occupied a large part of our time. The results have been published by the bureau (see Public Health Bulletin 43, United States Public Health and Marine-Hospital Service). Since the publication of this bulletin our work indicates that we have succeeded in identifying microscopically the causative agent. Much of the earlier work in connection with this disease has been repeated for the purpose of securely establishing facts which were set forth in the publication referred to. Scientific visitors who come to the laboratory express the opinion that this plague-like disease is a most important subject for investigation. It so perfectly counterfeits the lesions of plague in rodents and in monkeys that we are strongly inclined to believe that it is infectious for man and might cause confusion in the diagnosis of plague.

Five cases of tuberculosis among ground squirrels have come under observation. These have been carefully studied and the results indicate that probably the infection is due to the tubercle bacillus of the bovine type. Further work, especially in connection with immunization, and virulence for calves will be carried out as soon as practicable.

Rat leprosy.—Numerous attempts to grow the organism of this disease have been made, but without success. The susceptibility of various rodents has been tested, but thus far none have been successfully inoculated except the gray rat, *Mus norvegicus*, and the white rat.

Cholera.—When cholera appeared in Hawaii it was recognized that there was danger of the invasion of this country and that this laboratory should be prepared to undertake the scientific diagnosis of the disease without delay. Consequently the medical officers familiarized themselves with the isolation and identification of the cholera vibrio and with the production and testing of cholera immune serum.

Disinfectants.—Numerous experiments were conducted for the purpose of determining the efficiency of sulphur dioxide and carbon bisulphide as rodent-killing agents. The results, which agree with those obtained by previous workers, indicate that sulphur dioxide, while effective, has very poor penetrating powers, and that bisulphide is very effective and possessed of good penetrating powers. The latter agent is so extremely dangerous to animal life, and so inflammable and explosive that its value as a rodent destroyer probably will be limited to use in killing ground squirrels and other rural rodents.

A number of liquid disinfectants have been tested, including the one that is used for the routine disinfecting at the laboratory.

EDUCATION AND EXHIBITS.

One medical officer of the Army was afforded the opportunity of familiarizing himself with the pathology and bacteriology of plague as it is seen in rodents.

A large number of specimens on microscopical slides were furnished to the California State Board of Health for use in connection with their "sanitation exhibit boxes," which were sent to various parts of the State.

An exhibit was prepared for the meeting of the State and Territorial health officers with the Public Health and Marine-Hospital Service, and a rather complete collection of specimens was forwarded to Los Angeles, Cal., to be shown at the meeting of the American Medical Association, June 26–30, 1911.

The furnishing of "Kaiserling" preparations to medical colleges was completed and there is now no medical teaching institution in the United States that applied for specimens that has not been provided with them.

Students from the local medical colleges have been given an opportunity to observe the work at the laboratory.

AID RENDERED TO BRANCHES OF THE FEDERAL GOVERNMENT AND TO STATES BY THE FEDERAL LABORATORY.

One speciment of blood was forwarded from the marine hospital for a Widal reaction. The result was negative.

Rodents from ships fumigated at the quarantine station on Angel Island have been examined. No case of plague was detected.

The routine examination of the artesian water supply at the immigration station, Angel Island, has been carried on for a period of over six months. The results indicate that the water contains an excessive number of bacteria growing at incubator temperature, as well as a large number growing at room temperature. Colon bacilli were present in a number of the samples. This office has expressed the opinion that the water as it comes from the well is not fit for human consumption.

At the request of the Food Inspection Bureau of the Department of Agriculture, a shipment of oysters that had been forwarded from the Atlantic coast to San Francisco was submitted to bacteriological examination to determine sewage infection. The work, which was carried on by Asst. Surg. Chapin, failed to show evidence of any notable pollution, although the difficulty and possible fallacy in determining the contamination of oysters that had been so long in transit was understood.

One leprosy suspect was examined at the request of the health officer of Santa Clara County, Cal. The clinical diagnosis was easily made and acid-fast bacilli were demonstrated in the smears from nodules on the patient's face. The history appeared to indicate that the infection had been contracted in the Hawaiian Islands. The patient was of Japanese nationality.

One man, an American, came from Idaho to the laboratory for the purpose of having a diagnosis made. Careful clinical examination showed that the individual was suffering from leprosy, and a microscopical examination confirmed the diagnosis. The patient was turned over to the city authorities for incarceration in the San Francisco Leprosy Hospital. The infection was probably acquired in the Philippine Islands.

PERSONNEL.

The officers engaged in plague-suppressive measures in California and near-by States, exclusive of the laboratory, consist of Surg. Rupert Blue, in command; Passed Asst. Surg. Hugh de Valin, Passed Asst. Surg. Friench Simpson, Acting Asst. Surg. George M. Converse, Acting Asst. Surg. Theodore G. Howe, and Pharmacist Walter H. Keen.

The officers on duty at the laboratory are Passed Asst. Surg. George W. McCoy, bacteriologist and pathologist; Asst. Surg. Charles W. Chapin, and Acting Asst. Surg. Arthur A. O'Neill.

Employees, 185.

SUMMARY.

The achievements of the service in plague-suppressive measures in California and near-by States have been as follows:

First. Through maintenance of squirrel-free zones the reinfection of cities has been prevented.

Second. The area of infection is believed to have been definitely outlined.

Third. Plague has apparently been eradicated from three counties, namely, San Francisco, Los Angeles, and San Luis Obispo.

Fourth. In addition to counties investigated prior to the present fiscal year, twenty-two additional counties in California, one in Oregon, and three in Nevada, have been investigated and no plague infection has been found. Reconnoissance work has also been done in certain sections of Arizona without finding infection.

Fifth. The possible routes by which infection could spread to the east have been learned through the discovery of the presence of squirrels in the passes of the Sierra Nevada Mountains.

Sixth. Indirectly, the sanitary condition of the cities in which plague-suppressive measures have been carried on has been materially improved.

Seventh. By the destruction of squirrels on a large scale economic benefits have resulted to farmers, ranchers, and land owners.

CONCLUSIONS.

From the statements that have preceded it will be readily seen that plague-suppressive measures must be continued in California for such period of time as will insure the entire eradication of the disease. It will also be seen that on account of the extensive area in which infection has spread, and on account of the fact that plague has appeared on the eastern side of the San Joaquin River in close proximity to the foot hills of the Sierra Nevada Mountains and the passes through these mountains, that it will be necessary to materially increase the force engaged.

It is also evident that for both public health and economic reasons squirrels should be exterminated throughout the entire State, whether found in infected areas or not, as rapidly as possible.

PLAN OF OPERATIONS FOR THE COMING FISCAL YEAR.

Inasmuch as the plague-infected area is now believed to be definitely known, the work during the coming year will be modeled along slightly different lines than heretofore and will be carried out approximately as follows:

First. The maintenance of squirrel-free zones around the cities bordering upon San Francisco Bay.

Second. The maintenance of squirrel-free zones around the foci situated at Ripon and Modesto in the counties of San Joaquin and Stanislaus, to prevent the spread of infection among rodents to the eastward.

Third. The destruction of all foci east of the San Joaquin River.

Fourth. Joint Federal and county inspection and squirrel extermination in all counties in which infection has been demonstrated and in counties contiguous thereto.

Fifth. Reconnoissance work and the collection of squirrels in such parts of the States of California, Oregon, Nevada, and Arizona, as may be deemed necessary to determine whether infection has spread beyond the area to which it is now believed to be confined.

It is expected, and in fact, has already been demonstrated, that a greater number of plague-infected squirrels will be found during the coming year, than has been found during the past fiscal year. This statement is based upon the fact that during the past fiscal year the principal measures have been in the nature of investigations to determine the uttermost limits of the infection, hence the small number of infected squirrels found.

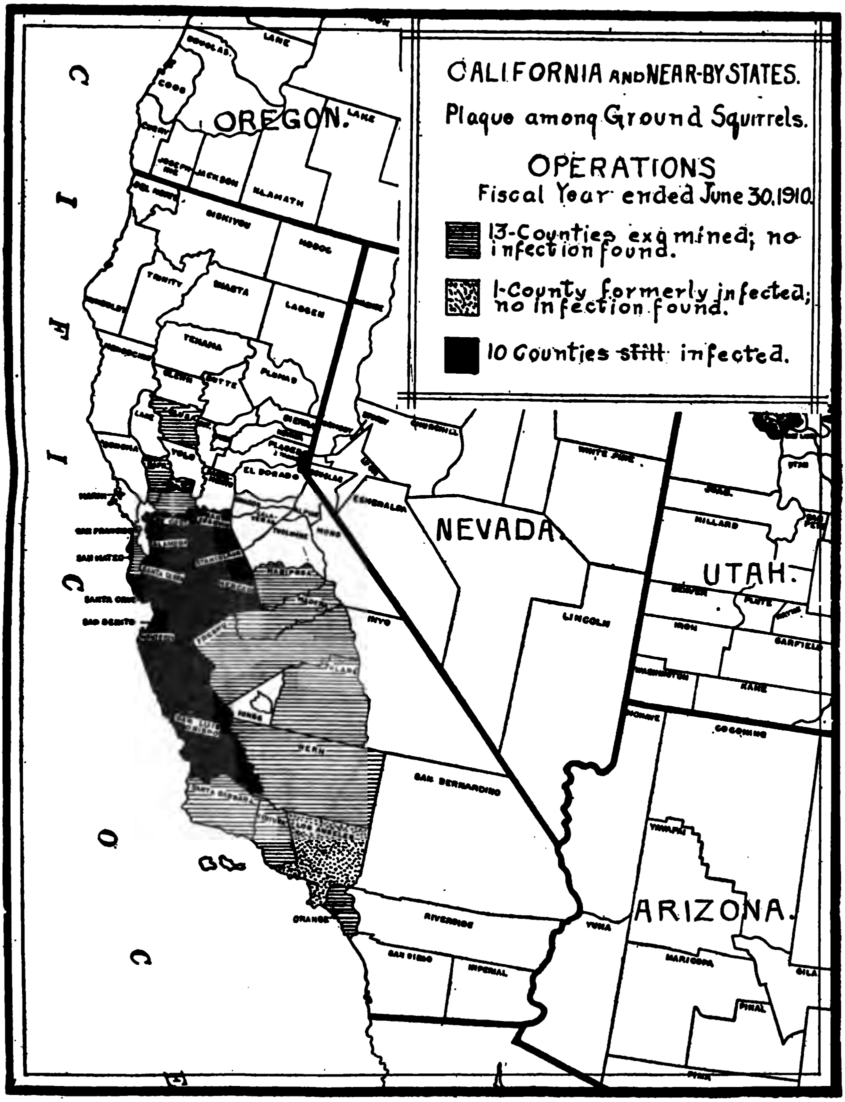
As our efforts during the coming year will be largely directed toward the elimination of known foci of infection many more infected squirrels will be found than heretofore.

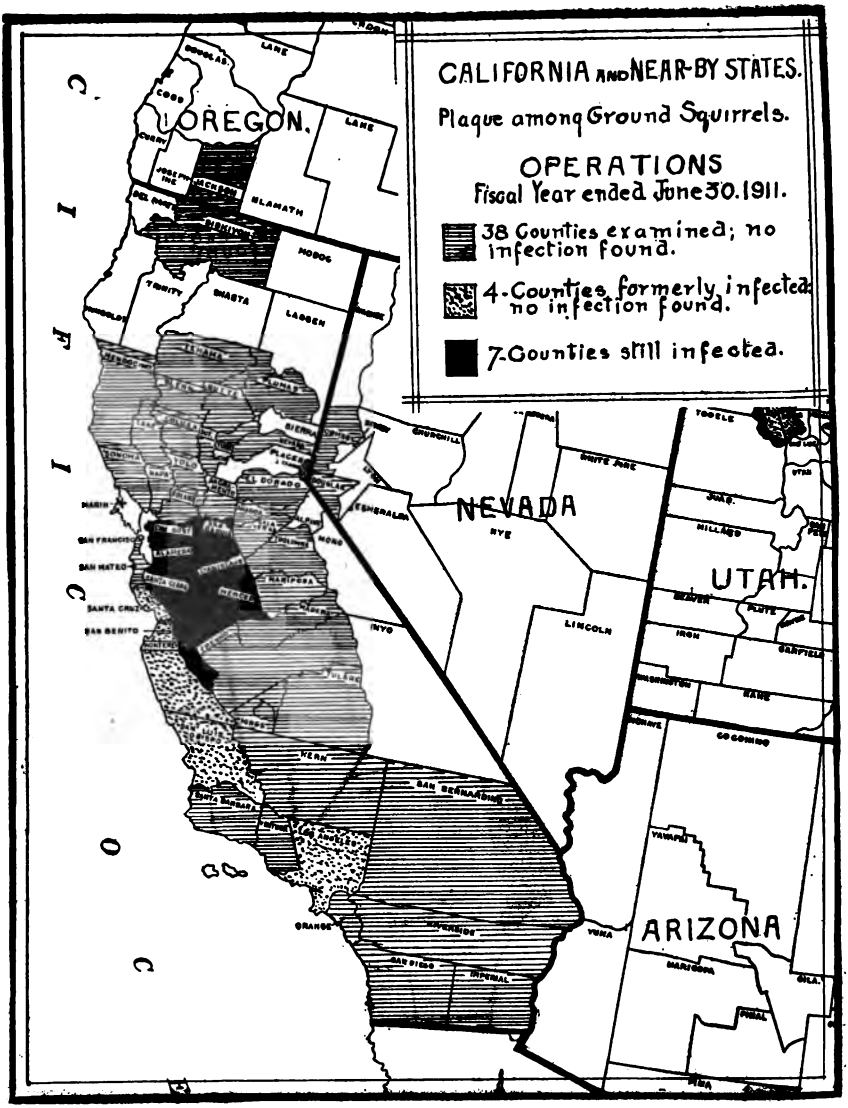
REVIEW OF PLAGUE-SUPPRESSIVE MEASURES.

HISTORY.

Last outbreak began in San Francisco, Cal., August 12, 1907.

- San Francisco:
  - Human cases—
    - Cases, 159; deaths, 77.
    - First case, August 12, 1907.
    - Last case, January 30, 1908.
  - Rodent cases—
    - Infected rats found, 398.
    - Last infected rat, October 23, 1908.
- Oakland:
  - Human cases—
    - Cases, 12; deaths, 7.
    - First case, September 12, 1907.
    - Last case, December 22, 1907.
  - Rodent cases—
    - Infected rats found, 126.
    - Last infected rat, December 1, 1908.
- Berkeley:
  - Human cases—
    - Cases, 1; deaths, 1.
    - Date occurred, August 27, 1907.
  - Rodent cases, none.
- Point Richmond:
  - Human cases—
    - Cases, 1; deaths, none.
    - Date occurred, November 27, 1907.
  - Rodent cases, none.


CALIFORNIA AND NEAR-BY STATES.
Plague among Ground Squirrels.
OPERATIONS
Fiscal Year ended June 30, 1910.
▤ 13-Counties examined; no infection found.
▨ 1-County formerly infected; no infection found.
■ 10 Counties ~~still~~ infected.
OREGON.
NEVADA.
UTAH.
ARIZONA.
C
I
F
I
C
O
C
DOUGLAS
LANE
COOS
CURRY
JOSEPHINE
JACKSON
KLAMATH
LAKE
DEL NORTE
SISKIYOU
MODOC
TRINITY
SHASTA
LASSEN
HUMBOLDT
TEHAMA
MENDOCINO
GLENN
BUTTE
PLUMAS
LAKE
SIERRA
NEVADA
PLACER
SONOMA
YOLO
EL DORADO
DOUGLAS
ORMSBY
CHURCHILL
ESMERALDA
MARIN
SAN FRANCISCO
SAN MATEO
SANTA CRUZ
SAN BENITO
ALAMEDA
STANISLAUS
SANTA CLARA
MERCED
CALAVERAS
TUOLUMNE
MONO
MARIPOSA
MADERA
FRESNO
INYO
MONTEREY
TULARE
KINGS
SAN LUIS OBISPO
KERN
SANTA BARBARA
VENTURA
LOS ANGELES
ORANGE
SAN BERNARDINO
RIVERSIDE
SAN DIEGO
IMPERIAL
WHITE PINE
LINCOLN
JUAB
MILLARD
BEAVER
PIUTE
IRON
GARFIELD
WASHINGTON
KANE
MOHAVE
COCONINO
YAVAPAI
YUMA
MARICOPA
GILA
PINAL
PIMA



CALIFORNIA AND NEAR-BY STATES.

Plague among Ground Squirrels.

OPERATIONS

Fiscal Year ended June 30. 1911.

▤ 38 Counties examined; no infection found.

▨ 4-Counties formerly infected; no infection found.

■ 7-Counties still infected.

- **Los Angeles:**
  - Human cases—
    - Cases, 1; deaths, 1.
    - Date occurred, August 11, 1908.
  - Rodent cases—
    - Infected rats, none.
    - Infected squirrels, 1.
    - Date found, August 21, 1908.
- Rural California:
  - Human cases—
    - 1908. Contra Costa County: Cases, 2; deaths, 2.
    - 1909. Alameda County: Cases, 2; deaths, 1.
    - 1910. San Benito County: Cases, 1; deaths, 1.
    - 1910. Santa Clara County: Cases, 1; deaths, none.
    - 1911. Contra Costa County—
      - Cases, 2; deaths, 1.
      - Dates found, September 25, August 9.
    - 1911. San Joaquin County—
      - Cases, 1; deaths, none.
      - Date found, September 18.

Human cases	total	183
Deaths	do	91
Rodent cases:		
Infected squirrels		561
Infected rats		524
Total		1,085

EXTENT OF INFECTION.

[See maps.]

Total area of California, 155,980 square miles.

Plague infection has been found, since August 12, 1907, in twelve counties. Area, 20,273 square miles.

Plague infection is not now present in three counties that were formerly infected. Area, 7,559 square miles.

Plague infection is now known or believed to be present in nine counties. Area, 12,714 square miles.

METHOD OF SPREAD.

From person to person: Possible but not common. Occasionally in pneumonic form, but usually through the agency of fleas.

From rodent to person: Through agency of fleas. Is the usual method of spread.

From rodent to rodent: Usually through the agency of fleas, leaving a sick animal and biting a healthy one.

From place to place:

- Through diseased rodents carried on vessels and trains, with cargo or freight.
- Through persons becoming infected in one place and taking sick in another.
- By spread from animal to animal, and burrow to burrow, in sections where animals are numerous and colonies and burrows are close together. In California squirrels are especially numerous near cultivated lands, in forests, along railroad rights of way, and in other localities where food is plentiful, and the soft or loose nature of the soil will permit of easy burrowing.

BARRIERS TO SPREAD OF INFECTION FROM CALIFORNIA TO OTHER STATES TO THE EAST.

Natural barriers:

The San Joaquin River and its adjacent swamps were thought to be natural barriers, but infection has been found east of the river. The Sierra Nevada Mountains form natural barriers, with the exception of four passes in which squirrels exist continuous with squirrel life on both sides of the mountains.

Artificial barriers:

Squirrel-free zones. These are from one to several miles in width, depending upon the contour of the country, and are kept free from squirrels by constant trapping, poisoning, and shooting.

Utility of squirrel-free zones: To prevent rats in cities acquiring plague from squirrels in the suburbs and outlying districts, and to interrupt the continuous range of rodents, thus preventing spread of the disease.

Squirrel-free zones maintained: One around San Francisco; one around Berkeley, Oakland, and Alameda; and one east of the San Joaquin River in San Joaquin and Stanislaus Counties, to prevent infection spreading from that section to the passes in the Sierra Nevada Mountains, and thence into Nevada and the East.

PLAGUE-SUPPRESSIVE MEASURES.

Observation: In cities of San Francisco, Oakland, and Berkeley, to determine whether plague has reappeared or is likely to reappear. This measure is essential to prevent cases among persons. Rodent cases usually precede human cases by several months. Measures consist of rat destruction (trapping and poisoning), laboratory examination of dead rats, reports to local authorities who enforce sanitary measures for destruction of breeding and feeding places, and rat proofing of buildings, and, investigation of suspicious deaths among persons.

Destruction of known foci of infection: Consists of trapping, poisoning, and shooting of squirrels, and destruction of colonies and burrows. Area of infected counties—12,714 square miles. This measure is carried out by Federal and county authorities in cooperation.

Determination of new and unknown foci of infection: This measure is carried out by the service alone, and is to determine whether infection is appearing in new territory.

General squirrel eradication: This measure is being carried out by the service, in cooperation with the Department of the Interior in national parks, the Department of Agriculture in forest reserves, and with State and local authorities throughout the State, for both public health and economic reasons. The principal duty of the service in this connection is to furnish expert advice and supervision.

ORGANIZATION.

Headquarters, 111 New Montgomery Street, San Francisco, Cal. Surg. Rupert Blue in command; pharmacist, W. H. Keen. Employees: One assistant inspector, 1 foreman, and 1 laborer.

LABORATORY.

Army and DeHaro Streets, San Francisco, Cal. Passed Asst. Surg. George W. McCoy in charge. Assistants: Asst. Surg. Charles W. Chapin. Acting Asst. Surg. Arthur A. O'Neill. Employees: One laboratory assistant, 1 assistant inspector, 4 foremen, and 5 laborers.

STOREHOUSE FOR SUPPLIES.

Employees: One laborer.

SAN FRANCISCO DIVISION.

Headquarters, 111 New Montgomery Street, San Francisco, Cal. Acting Asst. Surg. George M. Converse in charge. Employees: Two inspectors, 4 foremen, and 34 laborers.

CALIFORNIA DIVISION—COAST DISTRICT.

Headquarters, 111 New Montgomery Street, San Francisco, Cal. Passed Asst. Surg. Hugh DeValin in charge. Assistant: Acting Asst. Surg. Theo. G. Howe. Oakland field force: One inspector, 2 foremen, and 7 laborers. Berkeley field force: Three laborers. Rural field force: Principal work, destruction of known foci of infection; operating in the counties of San Louis Obispo, Monterey, San Banito, Santa Cruz, Santa Clara, San Mateo, Alameda, and Contra Costa. Joint Federal and county inspection service: Organized for the enforcement of the "Act to exterminate rodents," approved by the California Legislature March 13, 1909. This service in the coast district is operating in the following counties: Contra Costa, Alameda, Santa Clara, Santa Cruz, and San Benito.

CALIFORNIA DIVISION—SAN JOAQUIN VALLEY DISTRICT.

Headquarters, Fresno, Cal. Passed Asst. Surg. Friench Simpson in charge. Rural field force: Principal work, destruction of known foci of infection; operating in the counties of Kern, Kings, Tulare, Fresno, Madera, Merced, Mariposa, Stanislaus, Calaveras, and San Joaquin. Joint Federal and county inspection service: Organized for the enforcement of the "Act to exterminate rodents," approved by the California Legislature March 13, 1909. This service in the San Joaquin Valley district is operating in the counties of Stanislaus, Monterey, Mariposa, Merced, Fresno, Kings, Tulare, and Kern.

Employees engaged in the rural field work and the joint Federal and county inspection service consist of inspectors, assistant inspectors, foremen, and laborers (hunters). This force is changed from time to time, from one district to another, as the exigencies of the service require. The total number of employees engaged in this work is 117. In addition to the Federal employees, each county has a number of men employed, which corresponds to the number of supervisorial districts in each county.

EXPENDITURES.

Public Health and Marine-Hospital Service:

Past expenditures—		Average per month.
Fiscal year 1908	$300,904.71	$25,075.39
Fiscal year 1909	$275,046.06	22,754.00
Fiscal year 1910	$155,391.87	11,282.65
Fiscal year 1911	$162,320.40	13,526.70
Total	873,665.04	
Present expenditures		22,250.00

Headquarters—	
Salaries and commutations of officers per month	429.16
Salaries of employees do	265.00
Laboratory—	
Salaries and commutations of officers do	553.33
Salaries of employees do	927.50
Storehouse for supplies—Salary do	50.00
San Francisco division—Salaries do	3,260.00
California division—	
Salaries and commutations of officers do	579.99
Oakland—Salaries of employees do	805.00
Berkeley—Salaries of employees do	225.00
Field force—Salaries of employees do	9,395.00
Total do	16,489.98
Supplies, transportation, travel, office rent, telephones, and purchases of all kinds, whether contract or emergency, urban or rural	5,760.02
Total	22,250.00

State and local authorities:

Past expenditures—Since Aug. 12, 1907, State, municipal, and county authorities have expended a sum estimated to be between $500,000 and $600,000.

Present expenditures—	
State of California per month	700.00
Counties of California (13 at present) do	13,000.00
City of San Francisco do	1,350.00
Total	15,050.00

The Departments of Interior and Agriculture and the cities of Oakland and Berkeley are doing work, the value of which can not be estimated in figures, as it is done in addition to or in connection with other work.

ANTIPLAGUE OPERATIONS IN SEATTLE, WASH.

Antiplague operations in Seattle have been continued as in the past. Trapping, poisoning, and other measures have been carried out by the municipal department of health and sanitation. All rats collected were delivered to the service representative stationed in Seattle, who made the bacteriological examinations.

During the fiscal year a total of 49,212 rats were examined and no plague infection was found.

No human plague has been reported from Seattle since October 30, 1907. The last infected rat, except as stated later, was found on February 8, 1910.

Since the close of the fiscal year just passed, three plague-infected rats have been found, one August 26, 1911, and two on September

20 and 21, 1911. Measures to prevent the spread of the disease were at once instituted by municipal authorities.

ALASKA.

For a number of years the service has been cognizant of the deplorable sanitary conditions existent in the district of Alaska. Every year its officers, who accompany the revenue cutters on their annual cruise, have made reports upon the prevalence of contagious and infectious disease, and have given the number of persons to whom medical and surgical relief has been rendered. In addition, reports have been made describing the insanitary manner in which the natives live, the prevalence of preventable disease among them, the great number of deaths due to these diseases, and the dangers that menace the white population due to the presence of disease among the natives. The reports have invariably been accompanied by recommendations and suggestions for the betterment of conditions.

The more prevalent diseases are tuberculosis in all its forms, trachoma, syphilis, rheumatism, and pneumonia. At times outbreaks of measles occur with a high mortality, and smallpox when prevalent is of a severe and fatal type.

Estimates vary as to the prevalence of tuberculosis, but the majority of the reports place the prevalence of this disease at from 20 per cent of the population in the northern or Arctic portion of the district to 38 per cent to 50 per cent in the southwestern and southeastern portions.

In addition to the reports of service officers many reports essentially similar in character have been received from officers of the Army, Revenue-Cutter Service, from teachers and other employees of the Bureau of Education, and special reports have also been received from time to time.

For several years quarantine stations were maintained at Nome and Dutch Harbor. The Dutch Harbor station was soon discontinued, however, as not being necessary.

At present officers are stationed at Nome for quarantine purposes and to aid seamen who are beneficiaries of the service, at Juneau and Valdez for seamen, and at Ketchikan for quarantine inspection and to render aid to seamen.

Five or six years ago, the then Secretary of the Treasury requested authority, which was not granted, to expend a portion of the epidemic fund to prevent the spread of contagious and infectious disease in Alaska. Later an appropriation of $5,000 was asked for to care for several suspected lepers in the Cook Inlet region. During the last session of Congress and as a result of correspondence between the Department of the Interior, the Department of Justice, and this department, and after it had developed that none of the departments had either authority or appropriations for caring for the public health of Alaska, an amendment was prepared and added to the estimates in the sundry civil bill which asked for $50,000 for medical and surgical relief and sanitary measures relating to the Eskimos, Aleuts, Indians, and other natives of Alaska; for the care of lepers in Alaska; and to prevent the spread of contagious or infectious disease from one part of Alaska to another; all under regulations prepared by the Surgeon General of the Public Health and

Marine-Hospital Service approved by the Secretary of the Treasury. This was later modified in such manner as to place the appropriations under the Commissioner of Education, but none of the measures passed.

Early in the last fiscal year an urgent appeal was received from the governor, from the superintendent of education for southwestern Alaska, and from citizens of Seward that adequate measures be taken with reference to certain persons in the Cook Inlet region who were suspected of being lepers. Nothing could be done, but as a result of this reopening of the question of the prevalence of preventable disease, the Honorable, the Secretary of the Interior, in March, 1911, requested that an officer of the service be detailed to duty under the direction of the Commissioner of Education for the purpose of supervising all measures relative to the medical and surgical relief and sanitation of the natives of southern Alaska and for the purpose of making studies of the prevalence of disease in Alaska and of the conditions which favor its spread, with a view to inaugurating adequate measures for its prevention.

Pursuant to the above request Passed Asst. Surg. M. H. Foster was directed to report to the Commisioner of Education.

Dr. Foster was directed by the Commissioner of Education to proceed to Seward, Alaska, for the purpose for which he was detailed. He has since reported that the persons in the Cook Inlet region who were suspected of having leprosy are not lepers, and has devoted the balance of his time to furnishing medical and surgical relief to natives and to making studies of the prevalence of disease in Alaska and of conditions which favor its spread. His report had not been received prior to the close of the fiscal year.

Since the close of the fiscal year Dr. Foster has completed his investigations in Alaska, returned to the United States, and rendered his report to the Commissioner of Education. A plan based largely upon the observations and recommendations contained in his report is now in course of preparation, which, when placed in operation, it is believed will fully meet the requirements of the public-health situation in Alaska.

MEASURES TO PREVENT THE INTRODUCTION OF SMALLPOX INTO ALASKA.

Measures in the United States.—In April, 1911, one of the service representatives stationed on the Pacific coast reported to the bureau that smallpox was more or less prevalent, and that there was danger of its introduction into Alaska, especially as the annual rush for Alaska was about to begin, and large numbers of prospectors, miners, laborers, and others were leaving the various ports of the Pacific coast for Alaska within a short time.

On April 18 the representatives of the service stationed at the various ports on the Pacific coast were directed to notify steamship companies and others concerned that all crews should be vaccinated, and that all passengers should be vaccinated or show evidence of recent vaccination, or prove nonexposure to the disease for the preceding fourteen days. The State Department, upon request of the Secretary of the Treasury, instructed the consuls at Vancouver and Victoria to require bills of health for vessels running to ports in Alaska. An inspection was instituted at Ketchikan, the first port of call in Alaska, for all vessels from or via foreign ports. This latter measure was taken in order to prevent the introduction of the disease into Alaska by this route, through the agency of those persons who might seek to escape the measures in force at Pacific coast ports of the United States. In carrying out the foregoing measures, 78 vessels have been examined prior to sailing at ports of the United States; 7,832 persons have been inspected; 3,278 passengers and 1,969 members of crews have been vaccinated. That the measures taken were efficacious, is evidenced by the fact that no report of smallpox in Alaska has been received.

Measures in Canada.—On June 21, 1911, the Hon. Walter E. Clark, governor of Alaska, telegraphed that smallpox was present in Dawson, Canada, and requested that asssistance be furnished to protect the interior of Alaska. Passed Asst. Surg. M. H. Foster, on special duty with the Bureau of Education at Seward, Alaska, was immediately directed by telegraph to proceed to Juneau, consult with the governor, and if necessary to proceed to Dawson and investigate conditions and nominate acting assistant surgeons, if necessary, to enforce the quarantine regulations regarding the introduction of smallpox from a foreign country into territory of the United States. Officers were appointed for duty at Eagle and Skagway, Alaska, to prevent the introduction of the disease into northern and southeastern Alaska, respectively.

Passed Asst. Surg. Foster, in his report, states that the first case of smallpox reached Dawson April 2, 1911, and was sick at the time of arrival. He had come through Seattle before the order requiring vaccination of all persons bound for Alaska had been issued. The case was first diagnosed as grippe, and it was not until several other cases had developed that the diagnosis of smallpox was established. In this way the disease gained a foothold. The measures taken by the Canadian authorities soon eradicated the disease in Dawson and the measures instituted by the service prevented its introduction into the District of Alaska. Since the close of the fiscal year smallpox has been reported at New Rampart House, Canada, near the international boundary line.

Rampart House is the headquarters of the International Boundary Survey in Alaska. Dr. Gilbert K. Smith and Mr. Thomas Riggs, of the United States Coast and Geodetic Survey, in cooperation with the Canadian health authorities, instituted measures which were effective in confining the disease to the location in which it first appeared and prevented its entrance into the District of Alaska.

LEPROSY.

During the fiscal year cases of leprosy have been reported in the following States: Massachusetts, Rhode Island, Kansas, Florida, North Dakota, Pennsylvania, Idaho, Utah, and Oklahoma.

CHOLERA.

Cases of cholera and suspected cholera have been reported in the United States at the following places: Brooklyn and Auburn, N. Y.

Prompt measures have prevented the spread of the disease. Trained officers have been stationed at the following strategic points throughout the country so as to be available at the earliest possible moment in the event of necessity: New York City, Boston, Washington (D. C.), Chicago, San Francisco, New Orleans, and Savannah (Ga.),

INTERSTATE QUARANTINE REGULATIONS.

A careful study of the acts of Congress relating to the service has been made and following this a complete revision of the interstate quarantine regulations has been prepared. This revision is now subject to final review and legal opinion pending its presentation to the Secretary of the Treasury for approval and promulgation.

A card index has been kept of all articles appearing in technical journals having a bearing upon water supplies and their purification, sewage disposal and purification, disposal of garbage, ashes, refuse, and other subjects pertaining to public health and sanitation. Fairly complete studies of modern methods of handling these problems have been made.

SANITARY REPORTS AND STATISTICS.

PUBLIC HEALTH REPORTS.

Through the medium of the public health reports, information regarding sanitary conditions and the prevalence of epidemic diseases in the United States and in foreign countries was made currently available to health authorities, quarantine officers, and others whose spheres of work or interest included the public health. These reports are issued weekly in editions of 4,000 copies. By an extensive system whereby officers detailed at foreign ports report weekly by mail and when necessary by telegraph, and by the cooperation of the Department of State, by which American consuls make similar reports, a knowledge of the presence and extent of epidemic diseases in foreign countries has been secured.

In the United States information of the presence of epidemics and the geographic distribution of disease has been obtained through the reports of service officers and the cooperation of State and local health authorities. Tables have been published weekly showing the varying prevalence of diseases dangerous to the public health in the several States and municipalities in so far as the data were available.

MUNICIPAL ORDINANCES, RULES, AND REGULATIONS PERTAINING TO PUBLIC HYGIENE.

The interest in public hygiene in the United States, and the progress made in its application are in large measure shown by the activity of municipalities in safeguarding the public health. In order that information regarding the work being done in cities and the practices prevailing in municipal sanitation may be readily available to the many health officials and others interested, municipal sanitary ordinances and regulations adopted since January 1, 1910, have been published in the public health reports. In the future similar ordinances and regulations will be published when adopted. This will make accessible to sanitarians throughout the country the admirable work being accomplished and will be of assistance to municipal health authorities in the drafting of new ordinances or the amendment of old ones. This wide publicity of health ordinances will without doubt lead to the general adoption of the better ones and in time produce a certain uniformity throughout the country. At the end of the year the ordinances will be arranged under subjects and reprinted as a separate volume.

DIGEST OF LAWS AND REGULATIONS RELATING TO THE REPORTING OF SICKNESS.

A digest of the laws and regulations of the several States relating to the reporting of sickness has been prepared and published in a volume of 191 pages. The preparation of this digest was primarily necessary for the performance of bureau work, as the information was not otherwise available. It will, however, be found useful by State authorities, sanitarians, and others interested in the prevention of disease. The digest shows the requirements of each State and Territory for the notification of cases of sickness.

Reports of sickness are a necessity in public health work, and are the foundation upon which it depends for its success. Accepting the function of the health officer to be the prevention of disease, a knowledge of the prevalence and geographic distribution of the preventable diseases within his jurisdiction is essential to his work. This knowledge is possible only in so far as cases of sickness are reported.

As our knowledge of pathology and epidemiology increases, additions are being constantly made to the diseases classed as preventable. It has been long recognized that certain of the more contagious diseases, such as smallpox, scarlet fever, diphtheria, and measles, should be reported, in order that proper restriction, isolation, or other indicated measures might be enforced for the protection of the community or that the public might be warned of possible danger. A community having no means of knowing what contagious diseases are present, or how many cases there are, or where they are, is helpless to protect itself, and unnecessary sickness and death will result. Generally speaking, every case of an infectious disease is a focus, from which other cases may directly or indirectly arise unless preventive measures are taken. Every typhoid-fever patient has potential possibilities for harm through the contamination of water and food supplies, which may be so far-reaching that it is but proper that cognizance be taken of each case. The same is true of tuberculosis, except that its manner of spread is somewhat different. A majority of cases of this disease receive their infection from some existing human case. The disease is more or less chronic in character, and the patient continues to be a focus from which the infection may spread for months and sometimes years. If tuberculosis, which has so gravely affected mankind, is to be made a decreasing cause of unnecessary sickness and premature death, the location and activity of those affected must be known, that they may be properly instructed how to conduct themselves that others may not be unduly endangered, that they may learn the ethical code to which the tuberculous should conform, and that its observance may be made as effective and easy as present knowledge can make it.

Yellow fever is a disease of quite another type, spread in an entirely different way, but the importance of having each case reported at the earliest possible date has deservedly made a profound impression upon those living in infectible territory. And yet the ravages of this disease through sickness and death are no greater perhaps than those of other diseases which are more constantly present, and which very probably might be as effectually curtailed.

The above-named diseases serve as a few commonplace examples to illustrate the necessity for the notification of cases of sickness. The general statement may be made that in order to prevent the undue spread of the infectious diseases of man it is necessary for existing cases to be reported to some authority possessing the power and facilities to take such action as may be necessary to prevent the spread of the infection to others. The reporting of cases is the only reliable means a community has of knowing promptly when unusual disease conditions or epidemics exist, and when, therefore, greater care must be taken for the protection of the public. The reporting of all cases of certain diseases occurring on watersheds is necessary for the proper protection of water supplies. The reporting of all cases of sickness capable of being spread through milk when they occur at places where milk is produced, handled, or distributed is necessary to prevent epidemics of milk-borne disease.

Increased attention and consideration are being given to the subject by health authorities in general. The diseases which are required to be reported vary in the several States. Those for which notification is compulsory in one or more States and the number of States in which this requirement is made are as folows:

Disease.	Number of States. requiring notification.	Disease.	Number of States requiring notification.
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Cerebro-spinal meningitis	23	Relapsing fever	1
Chagres fever	1	Rocky Mountain (spotted) fever	1
Chicken pox	13	Scarlet fever	38
Cholera (Asiatic)	36	Smallpox	43
Dengue	4	Syphilis	1
Diphtheria	38	Tetanus	4
Dysentery	1	Trachoma	7
Epidemic dysentery	2	Trichiniasis	3
Erysipelas	3	Tuberculosis:	
Favus	1	All forms	20
German measles	3	Communicable forms	1
Glanders	8	Abdominal	1
Gonococcus infection	1	Laryngeal	4
Leprosy	21	Pulmonary	9
Malarial fever	2	Typhoid fever	24
Measles	23	Typhus fever	24
Mumps	3	Uncinariasis	4
Ophthalmia neonatorum	18	Whooping cough	17
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At the Ninth Annual Conference of State and Territorial Health Officers with the Public Health and Marine-Hospital Service, held at San Francisco, Cal., June 24, 1911, the following motion was made by the secretary of the Kansas State Board of Health, seconded by the secretary of the California State Board of Health, and carried:

> I move that it is the consensus of opinion of this conference that the Surgeon General of the Public Health and Marine-Hospital Service be asked to constitute a registration area for morbidity statistics.

The establishment of such an area will depend upon the cooperation of the several States, but as the need for more exact information of the occurrence and geographic distribution of sickness is appreciated, it would seem to be a practicable undertaking.

NOMENCLATURE OF CAUSES OF SICKNESS AND DISABILITY.

On account of the nonexistence of a wholly satisfactory and generally accepted nomenclature of causes of sickness and disability in the English language it has become necessary to prepare a new one. For this purpose a board of officers of the service has been appointed

Marine-Hospital Service approved by the Secretary of the Treasury. This was later modified in such manner as to place the appropriations under the Commissioner of Education, but none of the measures passed.

Early in the last fiscal year an urgent appeal was received from the governor, from the superintendent of education for southwestern Alaska, and from citizens of Seward that adequate measures be taken with reference to certain persons in the Cook Inlet region who were suspected of being lepers. Nothing could be done, but as a result of this reopening of the question of the prevalence of preventable disease, the Honorable, the Secretary of the Interior, in March, 1911, requested that an officer of the service be detailed to duty under the direction of the Commissioner of Education for the purpose of supervising all measures relative to the medical and surgical relief and sanitation of the natives of southern Alaska and for the purpose of making studies of the prevalence of disease in Alaska and of the conditions which favor its spread, with a view to inaugurating adequate measures for its prevention.

Pursuant to the above request Passed Asst. Surg. M. H. Foster was directed to report to the Commisioner of Education.

Dr. Foster was directed by the Commissioner of Education to proceed to Seward, Alaska, for the purpose for which he was detailed. He has since reported that the persons in the Cook Inlet region who were suspected of having leprosy are not lepers, and has devoted the balance of his time to furnishing medical and surgical relief to natives and to making studies of the prevalence of disease in Alaska and of conditions which favor its spread. His report had not been received prior to the close of the fiscal year.

Since the close of the fiscal year Dr. Foster has completed his investigations in Alaska, returned to the United States, and rendered his report to the Commissioner of Education. A plan based largely upon the observations and recommendations contained in his report is now in course of preparation, which, when placed in operation, it is believed will fully meet the requirements of the public-health situation in Alaska.

MEASURES TO PREVENT THE INTRODUCTION OF SMALLPOX INTO ALASKA.

Measures in the United States.—In April, 1911, one of the service representatives stationed on the Pacific coast reported to the bureau that smallpox was more or less prevalent, and that there was danger of its introduction into Alaska, especially as the annual rush for Alaska was about to begin, and large numbers of prospectors, miners, laborers, and others were leaving the various ports of the Pacific coast for Alaska within a short time.

On April 18 the representatives of the service stationed at the various ports on the Pacific coast were directed to notify steamship companies and others concerned that all crews should be vaccinated, and that all passengers should be vaccinated or show evidence of recent vaccination, or prove nonexposure to the disease for the preceding fourteen days. The State Department, upon request of the Secretary of the Treasury, instructed the consuls at Vancouver and Victoria to require bills of health for vessels running to ports in Alaska. An inspection was instituted at Ketchikan, the first port of call in Alaska, for all vessels from or via foreign ports. This latter measure was taken in order to prevent the introduction of the disease into Alaska by this route, through the agency of those persons who might seek to escape the measures in force at Pacific coast ports of the United States. In carrying out the foregoing measures, 78 vessels have been examined prior to sailing at ports of the United States; 7,832 persons have been inspected; 3,278 passengers and 1,969 members of crews have been vaccinated. That the measures taken were efficacious, is evidenced by the fact that no report of smallpox in Alaska has been received.

Measures in Canada.—On June 21, 1911, the Hon. Walter E. Clark, governor of Alaska, telegraphed that smallpox was present in Dawson, Canada, and requested that asssistance be furnished to protect the interior of Alaska. Passed Asst. Surg. M. H. Foster, on special duty with the Bureau of Education at Seward, Alaska, was immediately directed by telegraph to proceed to Juneau, consult with the governor, and if necessary to proceed to Dawson and investigate conditions and nominate acting assistant surgeons, if necessary, to enforce the quarantine regulations regarding the introduction of smallpox from a foreign country into territory of the United States. Officers were appointed for duty at Eagle and Skagway, Alaska, to prevent the introduction of the disease into northern and southeastern Alaska, respectively.

Passed Asst. Surg. Foster, in his report, states that the first case of smallpox reached Dawson April 2, 1911, and was sick at the time of arrival. He had come through Seattle before the order requiring vaccination of all persons bound for Alaska had been issued. The case was first diagnosed as grippe, and it was not until several other cases had developed that the diagnosis of smallpox was established. In this way the disease gained a foothold. The measures taken by the Canadian authorities soon eradicated the disease in Dawson and the measures instituted by the service prevented its introduction into the District of Alaska. Since the close of the fiscal year smallpox has been reported at New Rampart House, Canada, near the international boundary line.

Rampart House is the headquarters of the International Boundary Survey in Alaska. Dr. Gilbert K. Smith and Mr. Thomas Riggs, of the United States Coast and Geodetic Survey, in cooperation with the Canadian health authorities, instituted measures which were effective in confining the disease to the location in which it first appeared and prevented its entrance into the District of Alaska.

LEPROSY.

During the fiscal year cases of leprosy have been reported in the following States: Massachusetts, Rhode Island, Kansas, Florida, North Dakota, Pennsylvania, Idaho, Utah, and Oklahoma.

CHOLERA.

Cases of cholera and suspected cholera have been reported in the United States at the following places: Brooklyn and Auburn, N. Y.

Prompt measures have prevented the spread of the disease. Trained officers have been stationed at the following strategic points throughout the country so as to be available at the earliest possible moment in the event of necessity: New York City, Boston, Washington (D. C.), Chicago, San Francisco, New Orleans, and Savannah (Ga.),

INTERSTATE QUARANTINE REGULATIONS.

A careful study of the acts of Congress relating to the service has been made and following this a complete revision of the interstate quarantine regulations has been prepared. This revision is now subject to final review and legal opinion pending its presentation to the Secretary of the Treasury for approval and promulgation.

A card index has been kept of all articles appearing in technical journals having a bearing upon water supplies and their purification, sewage disposal and purification, disposal of garbage, ashes, refuse, and other subjects pertaining to public health and sanitation. Fairly complete studies of modern methods of handling these problems have been made.

SANITARY REPORTS AND STATISTICS.

PUBLIC HEALTH REPORTS.

Through the medium of the public health reports, information regarding sanitary conditions and the prevalence of epidemic diseases in the United States and in foreign countries was made currently available to health authorities, quarantine officers, and others whose spheres of work or interest included the public health. These reports are issued weekly in editions of 4,000 copies. By an extensive system whereby officers detailed at foreign ports report weekly by mail and when necessary by telegraph, and by the cooperation of the Department of State, by which American consuls make similar reports, a knowledge of the presence and extent of epidemic diseases in foreign countries has been secured.

In the United States information of the presence of epidemics and the geographic distribution of disease has been obtained through the reports of service officers and the cooperation of State and local health authorities. Tables have been published weekly showing the varying prevalence of diseases dangerous to the public health in the several States and municipalities in so far as the data were available.

MUNICIPAL ORDINANCES, RULES, AND REGULATIONS PERTAINING TO PUBLIC HYGIENE.

The interest in public hygiene in the United States, and the progress made in its application are in large measure shown by the activity of municipalities in safeguarding the public health. In order that information regarding the work being done in cities and the practices prevailing in municipal sanitation may be readily available to the many health officials and others interested, municipal sanitary ordinances and regulations adopted since January 1, 1910, have been published in the public health reports. In the future similar ordinances and regulations will be published when adopted. This will make accessible to sanitarians throughout the country the admirable work being accomplished and will be of assistance to municipal health authorities in the drafting of new ordinances or the amendment of old ones. This wide publicity of health ordinances will without doubt lead to the general adoption of the better ones and in time produce a certain uniformity throughout the country. At the end of the year the ordinances will be arranged under subjects and reprinted as a separate volume.

DIGEST OF LAWS AND REGULATIONS RELATING TO THE REPORTING OF SICKNESS.

A digest of the laws and regulations of the several States relating to the reporting of sickness has been prepared and published in a volume of 191 pages. The preparation of this digest was primarily necessary for the performance of bureau work, as the information was not otherwise available. It will, however, be found useful by State authorities, sanitarians, and others interested in the prevention of disease. The digest shows the requirements of each State and Territory for the notification of cases of sickness.

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NOMENCLATURE OF CAUSES OF SICKNESS AND DISABILITY.

On account of the nonexistence of a wholly satisfactory and generally accepted nomenclature of causes of sickness and disability in the English language it has become necessary to prepare a new one. For this purpose a board of officers of the service has been appointed and is now engaged upon the work, the members of the board performing this duty in addition to their regular official assignments.

The nomenclature heretofore used by the service was one drawn up by a joint committee appointed by the Royal College of Physicians of London, but this has now become inadequate, and the book is also out of print.

The preparation of the new nomenclature will involve much labor on the part of the board, but when completed in the form now outlined it will prove to be of great value in the work of the service, and will also doubtless be extremely useful to State and local health officers and to hospitals and other institutions.

PELLAGRA IN THE UNITED STATES.

Pellagra continues prevalent in the United States. Cases are being reported over a continuously increasing area. The exact prevalence of the disease, however, is unknown, because of the difficulty of getting reports. The disease is required to be reported in only four States, and there are reasons to believe that only a small percentage of existing cases becomes a matter of record in even these States. Pellagra was unknown in the United States previous to the year 1907, with the exception of an occasional isolated case.

The advent of a new disease is always a propitious time for its study and eradication. For this reason, if for no other, it is desirable to know the rapidity with which the disease is extending and the routes by which it travels. By the study of these factors it is possible that the cause may be ascertained and means found for preventing the spread of the disease, and possibly for eradicating it. The reporting of cases of this disease works no hardship on physicians and the information to be obtained in this way is of such value that without question reports should be required.

POLIOMYELITIS IN THE UNITED STATES.

Until recent years poliomyelitis (infantile paralysis) was a very rare disease in the United States. During the years 1907, 1908, 1909, and 1910 outbreaks appeared in various sections of the country and much attention was given to the subject on the part of health authorities and others. During the calendar year 1910 a total of 5,093 cases, with 825 deaths, was reported to the bureau by the health authorities of 31 States, Hawaii, and the District of Columbia. Undoubtedly there were many more cases, but they were either not diagnosed or occurred in States in which the reporting of the disease was not required and therefore failed to become a matter of record. From January 1 to June 30, 1911, the disease seems to have been less prevalent. This may have been due to the fact that the greater number of cases of poliomyelitis usually occur in the autumn, or it may be that the disease is becoming less active. The geographic and chronologic distribution as reported for the calendar year 1910 and for the first six months of 1911 is shown in the following tables:

TABLE NO. 1.—*Poliomyelitis, cases and deaths reported during the calendar year 1910.*

States.	Jan.		Feb.		Mar.		Apr.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		Total.		Remarks.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Alabama																											No reports.
Arizona																											Do.
Arkansas																											Do.
California																	13	2	9	3	11	4			33	9	December report not yet received.
Colorado																	4		1	1					5	1	Reports not complete.
Connecticut												1	18	2	36	9	71	10	31	7	10	2	2	1	168	32	
Delaware													2	1											2	1	Do.
District of Columbia													7		93	11	20	2	18	1	1	1			139	15	
Florida																	4		1				1		6		
Georgia																											No reports.
Hawaii (Honolulu)																									42	1	From second week in September to Dec. 15, 1910, there were 42 cases, 1 death.
Idaho							1	1	1		5	1	44	4											96	6	96 cases reported during year.
Illinois															15	5	23	2	33	18	52	10	14	7	137	42	
Indiana																			77	11	56	14		4	133	29	
Iowa	3	3	1	1	4	2	7	2	25	2	20	2	54	7	156	44	198	39	116	32	43	18	11	9	638	161	
Kansas													57	15											189	47	Up to Nov. 20, 1910, 189 cases and 47 deaths.
Kentucky																											Present—no reports.
Louisiana																											No reports.
Maine																											Present.
Maryland													1	4	9	10	11	3	7	6	5	3			35	28	2 deaths were reported during the first 6 months of the year—statistics incomplete
Massachusetts	8		1		2		3		8					3	[2] 118		[1] 114		[1] 75		54		21		588		June and July, 1910, 184 cases reported; deaths not given.
Michigan															7	2	10	4	10	2	9	1	7	5	43	14	
Minnesota															89	13	77	16	55	3	6	1			227	69	Reports for year not complete. January to June, 1910, 36 deaths.
Mississippi																											No reports.
Missouri																											Do.
Montana																										6	Estimated cases, 40.
Nebraska																											No reports.
Nevada																											9 cases with 1 death during the years 1909 and 1910.
New Hampshire													5	2											5	2	

[1] Approximate.

[2] This is the minimum number.

TABLE NO. 1.—*Poliomyelitis, cases and deaths reported during the calendar year 1910*—Continued.

States	Jan.		Feb.		Mar.		Apr.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		Total.		Remarks.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
New Jersey																									75		75 cases during the year from 55 localities.
New Mexico																											No reports.
New York									1		1		10		28	12	97	16	43	21	33	9	4	2	217	60	
North Carolina																											Do.
North Dakota													11		29	1	38	1	11	1	10	2	1		100	5	
Ohio																			24		28				52		Reports not complete.
Oklahoma																									5	4	January to August, 1910, 5 cases, 4 deaths.
Oregon											2	2	18	5		1		1	5		9	11	2	1	36	21	
Pennsylvania													152		275	58	378	64	197	50	95	22	15		1,097	172	Reports for year not complete.
Rhode Island					1				4		5		46		70		65		9		4		2		231		During the year a total of 231 cases was reported.
South Carolina																									85	10	Cases reported between May 21 and Oct. 15.
South Dakota															15	1	25	11	31	3	10	2	5		86	17	
Tennessee																											No cases reported.
Texas																											Do.
Utah																					2	1			2	1	
Vermont																									13	2	13 cases, 2 deaths, to Oct. 1; no cases during balance of year.
Virginia															[1]30		[1]18				19	1	12	1	357	2	Jan. 1 to Oct. 12, 1910, 326 cases were reported.
Washington	1								7		24	1	40	1	103	15			51	17	20	9	8	6	254	49	
West Virginia																											No reports.
Wisconsin																									22	27	Estimated there were 500 cases.
Wyoming																											No reports.
Total	12	3	2	1	7	2	11	3	46	2	57	7	465	44	1,073	182	1,146	171	804	176	477	111	105	36	5,093	825	

[1] This is the minimum number.

TABLE NO. 2.—*Poliomyelitis, cases and deaths reported from January to June. 1911.*

State.	Jan.		Feb.		Mar.		Apr.		May.		June.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
California	2	1	3	....	....	....	....	....	....	....	....	1	5	2
District of Columbia	....	....	....	....	....	....	....	....	1	1	....	....	1	1
Florida	....	....	....	....	....	....	....	....	1	....	....	....	1	....
Idaho	....	....	....	....	....	....	2	....	2	1	....	....	4	1
Illinois	5	....	8	2	7	3	6	4	8	4	8	1	42	14
Indiana	....	7	....	4	....	1	....	3	....	7	....	2	....	24
Iowa	10	7	3	4	....	1	5	3	1	2	2	1	21	18
Maryland	2	2	....	2	....	1	....	1	1	2	....	....	3	8
Massachusetts	11	....	2	2	11	1	5	1	8	3	12	....	49	7
Mississippi	....	....	....	....	....	....	2	....	....	....	....	....	2	....
New York	4	7	2	2	2	7	4	3	2	1	7	1	21	21
North Dakota	....	....	....	....	....	....	....	....	1	....	2	....	3	....
Oregon	2	1	1	1	1	6	....	2	....	2	....	....	4	12
Pennsylvania	11	....	15	....	17	....	10	....	4	1	9	8	66	9
South Dakota	2	....	....	....	2	1	5	3	1	....	....	....	10	4
Virginia	2	3	5	10	....	....	....	....	....	....	....	....	7	13
Washington	2	2	3	4	5	1	3	2	2	1	12	....	27	10
Wisconsin	1	2	....	....	1	2	....	....	2	3	4	2	8	9
Total	54	32	42	31	46	24	42	22	34	28	56	16	274	153

MALTA FEVER IN THE UNITED STATES.

Malta fever has been found to exist in Texas near the Mexican border. Six cases of the disease were reported during May and June, 1911, five in goat herders, and one in a goat ranchman, at Del Rio and Langtry, Tex. The disease has also been found epidemic among goats in this locality.

Malta fever is a disease common on the Island of Malta and in certain localities bordering on the Mediterranean Sea. Its discovery in the United States is one of considerable importance, as it means that a disease heretofore exotic has established a foothold in this country and that health authorities should take cognizance of cases, and inaugurate measures for its eradication wherever found.

LEPROSY IN THE UNITED STATES.

From time to time cases of leprosy have been reported in the United States. Since January 1, 1911, nine cases have been reported to the bureau from seven States and the District of Columbia as follows:

Florida.—Dr. J. Y. Porter, State health officer, reported that during the week ended June 10, 1911, two cases of leprosy were reported in the State of Florida, one at Jacksonville and one at Key West.

Kansas.—Dr. S. J. Crumbine, secretary of the Kansas State Board of Health, reported June 19, 1911, that a case of leprosy had been discovered in Sedgwick County, Kans., in the person of an alien who had lived in the country for about two years as a railroad laborer. The patient was a native of Mexico. His family history was negative. The disease was characterized by nodules distributed over the body. The nails of the right hand showed trophic disturbances. The nodules were prominent on the face and in the mouth, especially over the hard palate. The feet had perforating ulcers at the base of the toes. The patient was well enough to do light work except for the soreness of the feet. Microscopical examination showed lepra bacilli in excised nodules.

North Dakota.—Dr. J. Grassick, secretary of the State Board of Health of North Dakota, reported May 26 that a case of leprosy had recently been found in Nelson County, in the person of a Norwegian who had resided in the United States for a period of 23 years. The patient was a farmer. He had arrived at Larimore, N. Dak., in 1888, via Quebec. The source of the infection was not known. The last-known exposure occurred 23 years previously. The father of the patient was said to have been a leper. The type of the disease was tubercular, and its duration had been about two years.

Rhode Island.—Dr. Gardner T. Swarts, secretary State Board of Health, Rhode Island, reported June 15 that a case of leprosy had been discovered in Rhode Island May 1, 1911, in the person of a boy aged 15 in attendance upon public school. The patient was born in Louisiana, where he lived for four years, and resided one year in North Carolina, and the rest of his life in Pawtucket, R. I. The symptoms of the disease probably date back five years. The case was discovered in the out-patient department of the Massachusetts General Hospital, and the boy was immediately transferred to his home in Pawtucket. The type of the disease was nodular and tubercular, affecting the face, including the nose and lips. There was some numbness of the face, and the leonine expression was present. Lepra bacilli were present in large quantities in the secretions from the nose. The hands were slightly thickened. The patient had been kept isolated in his own family.

New Jersey.—The health officer at Passaic, N. J., reported July 21 that a case of leprosy had been discovered at Passaic in April, 1911. The patient was a Chinese, aged 55 years, who had been employed as a laundryman, and had been in this country about eight years. He had lived in New York City six years before going to Passaic. The source of infection had not been determined. The case had been under observation since the time of discovery.

Massachusetts.—Dr. Mark W. Richardson, secretary of the State board of health, informed the bureau that a case of leprosy had been reported January 17 in the person of a Japanese who had gone to Boston seven years before, where he had resided for one year and a half. He then spent a year in Japan and six months in China. His home in Japan was 300 miles from Tokio. He was a carpenter by trade. Dr. Richardson further stated that a case of leprosy had been reported on May 10 in the person of an Italian woman who had landed in New York in September, 1907, and from there had gone directly to Boston where she had lived continuously up to the time of removal to the leprosy hospital at Penikese.

District of Columbia.—A case of leprosy was also reported in the District of Columbia.

SMALLPOX IN THE UNITED STATES.

Smallpox continues to be widely prevalent in the United States. No section of the country seems to be exempt. Reports received for the calendar year 1909 gave a total of 24,099 cases with 150 deaths. During the calendar year 1910 the number reported was 30,352 cases with 415 deaths. This shows a considerable increase in the number of deaths. The disease, however, was as a rule of an extremely mild form. Most of the deaths recorded occurred in a few isolated outbreaks of the virulent type of the disease. The number of cases reported represents only a part of those that occurred, it being impossible to get reports of the prevalence of the disease in some of the States, while only partial reports could be obtained from others.

The extreme mildness of the disease in the United States is a matter of much interest. Similar mild outbreaks have been reported in western Africa, in the West Indies, in certain parts of Brazil, and in Canada. In Brazil the virulent type of smallpox is also present, but the two types, the mild and the virulent, seem to retain their identity. The cases secondary to the mild type continue to be mild with a low case mortality rate, while those secondary to the ordinary or virulent type of the disease are of the virulent type with a case mortality rate of from 15 to 40 per cent.

In the United States also the two types of the disease have existed. There have been occasional localized outbreaks of the virulent type, and the secondary cases in these epidemics were almost without exception of the severe form. On the other hand, the widely prevalent mild type seems to produce only occasional cases of the graver form. Its case mortality rate is usually less than 1 per cent, and there are instances where in several thousand cases it has been below one half of 1 per cent. On the other hand in every outbreak of the virulent type of the disease the case mortality rate has been 15 per cent or higher.

PREVALENCE.

The general prevalence and geographic distribution of the disease, in so far as the data are available for the calendar year 1910, are shown by the tables on succeeding pages. Connecticut was the only State furnishing complete information in which no case was reported.

The greatest numbers of cases were reported in North Carolina, Texas, Michigan, Oklahoma, and Kansas, with 4,281, 2,925, 2,585, 2,342, and 2,202 cases, respectively. Tennessee reported 2,199 cases for a part of the year only.

The increase of the disease in Florida is notable. In this State only 3 cases were reported in 1909, while in 1910, 1,286 were recorded. There was also an increase in Colorado from 345 cases in 1909 to 1,096 in 1910, in the District of Columbia from 24 cases in 1909 to 96 in 1910, in Michigan from 1,175 in 1909 to 2,585 in 1910, in North Carolina from 1,733 to 4,281 cases, in Oklahoma from 1,434 to 2,342, in Pennsylvania from 25 to 168. and in the State of Washington from 310 to 583 cases.

A decrease is noted in Illinois from 2,135 cases in 1909 to 730 cases in 1910, in Indiana from 1,363 cases in 1909 to 764 cases in 1910, in Minnesota from 1,430 to 1,002, in New York from 762 to 353, in Ohio from 1,328 to 759, in Utah from 1,854 to 966, and in Wisconsin from 1,208 to 443 cases.

There was practically no change in the prevalence of the disease during the years 1909 and 1910 in the following States: Kansas, Montana, North Dakota, and Oregon. Comparatively but few cases of smallpox were reported in New Hampshire and New Jersey, and, as previously stated, there was none in Connecticut.

Although no reports are available for the State of Georgia as a whole, 389 cases were reported in the city of Macon.

There is no evidence at hand to indicate that the disease was less prevalent in the States from which reports for the year were not available than it was in those from which reports were received. In fact it would naturally be expected that an infectious disease such as smallpox would spread more rapidly and cause more cases in those States in which it was not promptly reported and in which therefore the number and location of cases were not known to the local and State authorities, who, therefore, would be placed at a disadvantage in their attempts to control the disease.

CASE RATE.

Utah had the highest case rate, the 966 cases reported being at the rate of 257.32 for each 100,000 inhabitants. In 1909 Utah also had the highest case rate with 507 cases for each 100,000 inhabitants. The next highest rates for 1910 were in North Carolina, Florida, Montana, Oklahoma, and Colorado with rates of 193.45, 169.5, 167.32, 139.75, and 136.23, respectively, for each 100,000 inhabitants. The lowest rate was in Connecticut with no case. The next lowest rates were Maryland, New Jersey, Maine, Pennsylvania, and New Hampshire, with rates of 0.46, 0.86, 1.07, 2.18, and 2.32, respectively.

FATALITY.

One of the most notable features of the smallpox which has been more or less prevalent in the United States for at least 10 years is its extreme mildness and the small number of deaths which it has caused. In 1909 the combined States from which complete reports were received had 19,534 cases with 92 deaths, which was a mortality rate of 0.471 for each 100 cases. In 1910 the rate was considerably higher, but still remarkably low when compared with the rates reported from other countries.

Reports as to the prevalence of smallpox during the calendar year 1910 and the number of deaths due to this disease are available for the following States: Colorado, District of Columbia, Florida, Indiana, Iowa, Kansas, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Texas, Utah, and Washington.

These States with a combined estimated mid-year population of 54,435,700 reported 23,552 cases with 385 deaths, an average of 43.27 cases for each 100,000 inhabitants and 1.63 deaths in each 100 cases.

In outbreaks of smallpox reported abroad the deaths usually number from 15 to 40 for each hundred cases. To explain the small number of deaths in the United States, we may presume that either the people are partially immune to the disease or that the existing infection is extremely mild and nonvirulent, or both.

The reason for the extreme mildness of the smallpox which has been so prevalent generally in the United States has not been definitely determined. The opinion has been held by some that it is a modified form resulting from the presence of the disease in a country where the people are protected by vaccination, the individuals either having been vaccinated or having inherited a degree of immunity from parents or grandparents who had been. It is not believed that this is a satisfactory explanation, nor that the practice of vaccination in the United States is sufficiently general, or has been so at any time in the past, to warrant such an assumption. Mild smallpox has existed in practically all sections of the country, while on the other hand the practice of vaccination has not been general. A large proportion of the population has undoubtedly never been vaccinated, nor is it believed there is any evidence to show that their parents or grandparents had been. Also if the type of the disease has been changed by this means in the United States it would be natural to expect that a similar result would have occurred in other countries where the practice of vaccination has been equally or more extensive. No such modification of the disease has occurred in Germany, where vaccination and revaccination have been compulsory since 1875; nor in Japan, where the practice of vaccination is very probably as extensive as in the United States. In Germany the general practice of vaccination has almost eliminated smallpox as a cause of morbidity, and yet the few cases which do occur have approximately the usual fatality. There were reported in Germany in 1906, 256 cases of smallpox, with 47 deaths, and in 1907, 345 cases, with 63 deaths, the case mortality rate being approximately 18 per cent, while in the United States in 1909 the case mortality rate was less than 1 per cent.

A study of the smallpox histories of certain localities suggests that the existing degree of protection of the community by vaccination has not been the essential factor determining the virulence of the disease. In Saginaw, Bay City, and Lapeer, in Michigan, a mild type of smallpox had been present annually for many years. In the spring of 1910 virulent smallpox appeared in Bay City, and in the autumn of the same year a severe type appeared in Saginaw and Lapeer. There is no known reason for assuming that the vaccination status of the people of these cities had changed just before the onset of the more fatal form of the disease. There being no evidence to the contrary, it would be fair to suppose that the number of people in these cities protected by vaccination was as great in 1910 as during 1908 and 1909.

So far as the data can be obtained it appears that with few exceptions neither the mild nor the severe form of smallpox occurs in those protected by vaccination. Practically all the cases have been in individuals who had either never been vaccinated or who had been vaccinated many years before.

A possible explanation of the mild type of the disease in this country is that it is due to a less virulent strain of infection. This, then, raises the question as to the source of the more severe outbreaks which occur—that is, whether each outbreak is an instance of infection brought in from abroad or carried from some other virulent focus within the country, or whether the mild strain of the disease under certain conditions becomes virulent. This, it is believed, can be determined only by the careful noting of the salient facts in each case. A recording of the vaccination history of all smallpox cases would without doubt give much valuable information.

VIRULENT OUTBREAKS.

During the year there were recorded 11 localities in which smallpox showed a high death rate. In most of the instances these were apparently distinct and separate outbreaks, clearly differentiated from the cases of the milder type of the disease which had prevailed in the same localities previous to the onset of the more severe type, and which in some occurred afterwards as well. The virulent outbreaks occurred as follows:

In Bee County, Tex., during January, 1910, there were 12 cases of smallpox, with 5 deaths.

In Denton County, Tex., during January and February, 1910, there were 80 cases, with 14 deaths.

In Oklahoma County, Okla., from March to July, 1910, there were 37 cases, with 20 deaths.

In Grady County, Okla., from March to December, 1910, there were 50 cases, with 20 deaths.

In Bay City, Mich., from March to October, 1910, there were 114 cases, with 30 deaths.

In New York City, from April to May, 1910, there were 10 cases, with 3 deaths.

In Cleveland, Ohio, during May, June, and July, 1910, there were 62 cases, with 10 deaths.

In Reno County, Kans., during July, 1910, there were 8 cases, with 3 deaths.

In Saginaw, Mich., during October and November, 1910, there were 156 cases, with 47 deaths.

In Lapeer, Mich., during October, November, and December, 1910, there were 38 cases, with 19 deaths.

In Marion County, Oreg., during November and December, 1910, there were 9 cases, with 4 deaths.

TABLE No. 1.—*Showing, by States, cases reported, case rates, deaths reported, and case mortality rates of smallpox during calendar year 1910.*

	Cases.	Case rate per 100,000 inhabitants.[1]	Deaths.	Case mortality rate per 100.	Remarks.
Alabama	616		(?)		No available record of cases for entire State. These cases were reported in Birmingham, Mobile, and Montgomery.
Alaska	(?)		(?)		Cases not reported.
Arizona	(?)		(?)		No available record of cases.
Arkansas	106		(?)		No available record of cases for State. These cases were reported in Argenta, Little Rock, Lonoke, and Fort Smith.
California	177		1		Incomplete.
Colorado	1,096	136.23	7	0.64	
Connecticut	None.		None.		
Delaware	(?)		(?)		No available record of cases.
District of Columbia	96	28.89			
Florida	1,286	169.50	12	.93	
Georgia	389		(?)		No available record of cases for State. These cases were reported in the city of Macon.
Idaho	(?)		(?)		No available record of cases.
Illinois	730	12.91	(?)		
Indiana	764	28.24	1	.13	
Iowa	850	38.19	1	.12	
Kansas	2,202	129.77	12	.54	
Kentucky	(?)				Do.
Louisiana	860		5		Reports are incomplete.
Maine	8	1.07			
Maryland	6	.46			
Massachusetts	144	4.26			
Michigan	2,585	91.66	121	4.68	
Minnesota	1,002	48.18	9	.90	

[1] Based upon the estimated population July 1, 1910, as given by the Department of the Census.

TABLE No. 1.—*Showing, by States, cases reported, etc.*—Continued.

	Cases.	Case rate per 100,000 inhabitants.	Deaths.	Case mortality rate per 100.	Remarks.
Mississippi	227	......	5	......	No available record of cases for State. These cases were reported from 7 cities.
Missouri	287	......	2	......	Do.
Montana	634	167.32	1	0.16	
Nebraska	51	......	(?)	......	No available record of cases for State. These cases were reported from Lincoln and South Omaha.
Nevada	(?)	......	(?)	......	No available record of cases.
New Hampshire	10	2.32	......	......	
New Jersey	22	.86	......	......	
New Mexico	(?)	......	(?)	......	Do.
New York	353	3.85	8	2.26	
North Carolina	4,281	193.45	8	.18	
North Dakota	306	52.51	2	.65	
Ohio	759	15.88	10	1.32	
Oklahoma	2,342	139.75	99	4.22	
Oregon	164	24.18	5	3.05	
Pennsylvania	168	2.18	6	3.57	
Rhode Island	......	......	......	......	No cases reported.
South Carolina	(?)	......	(?)	......	No available record of cases.
South Dakota	365	......	1	......	Report complete for April to December, inclusive.
Tennessee	2,199	......	10	......	Incomplete.
Texas	2,925	74.72	67	2.29	
Utah	966	257.32	2	.21	
Vermont	......	......	......	......	No cases reported.
Virginia	350	......	6	......	No available record of cases for State. These cases were reported from 8 cities.
Washington	583	50.46	14	2.40	
West Virginia	(?)	......	(?)	......	No available record of cases.
Wisconsin	443	18.94	(?)	......	
Wyoming	(?)	......	(?)	......	Do.
Total	30,352	......	415	......	

TABLE No. 2.—*Showing cases of smallpox reported by months during calendar year 1910.*[1]

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Colorado	82	132	179	114	117	68	62	14	39	73	112	104	1,096
Florida	50	61	213	118	180	162	81	28	17	11	107	258	1,286
Illinois	170	32	88	58	74	92	24	16	8	52	84	32	730
Indiana	189	92	104	92	98	82	......	6	1	2	53	45	764
Iowa	122	109	97	141	68	76	23	17	9	12	50	126	850
Kansas	441	280	256	148	304	247	43	20	9	66	211	177	2,202
Maine	......	6	......	......	1	......	......	......	......	......	1	......	8
Maryland	1	......	......	1	3	......	1	......	......	......	......	......	6
Massachusetts	90	26	5	4	10	7	2	......	......	......	......	......	144
Michigan	290	262	356	253	370	316	104	65	32	101	339	97	2,585
Montana	122	116	68	64	70	53	33	8	15	18	17	50	634
New Hampshire	4	3	......	......	......	......	......	......	......	......	......	3	10
New Jersey	......	2	1	......	3	2	2	3	4	3	......	2	22
New York	51	50	69	61	55	41	10	10	1	1	2	2	353
North Carolina	877	758	429	317	249	219	115	91	45	197	244	740	4,281
North Dakota	46	32	107	14	22	20	6	38	2	3	9	7	306
Ohio	104	83	60	77	178	168	46	4	8	11	8	12	759
Oklahoma	238	388	390	475	214	267	69	51	65	46	48	91	2,342
Oregon	36	29	29	12	12	14	......	......	12	7	2	11	164
Pennsylvania	14	41	40	8	22	7	23	4	6	......	1	2	168
Texas	706	785	581	228	199	246	42	17	8	32	28	53	2,925
Utah	181	91	112	79	64	27	21	11	42	35	91	212	966
Washington	120	82	60	78	54	36	15	4	7	5	41	81	583
Wisconsin	39	63	66	33	50	37	32	10	12	14	37	50	443
Total	3,973	3,523	3,310	2,375	2,417	2,187	754	417	342	689	1,485	2,155	23,627

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[1] This table includes only the States for which the cases were reported by months.

TABLE No. 3.—*Smallpox, cases and deaths reported by months, January to June, 1911.*

	Jan.		Feb.		Mar.		Apr.		May.		June.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
California	21	1	10	1	21	....	19	....	8	....	3	....	82	2
Colorado	275	1	176	....	303	....	284	....	139	....	80	....	1,257	1
District of Columbia	......	....	......	....	......	....	......	....	......	....	......	....	[1] 23	....
Florida	......	....	......	....	......	....	......	....	......	....	......	....	[1] 1,898	5
Illinois	48	....	48	....	68	....	172	....	......	....	......	....	336	....
Indiana	156	....	99	....	117	2	162	....	208	....	90	1	832	3
Iowa	55	....	66	....	88	1	124	....	147	1	91	1	571	3
Kansas	160	....	279	1	430	2	244	....	221	3	99	1	1,433	7
Louisiana	44	1	......	....	31	....	18	....	......	....	......	....	93	1
Maine	......	....	......	....	......	....	2	....	4	....	3	....	9	....
Maryland	8	....	4	....	......	....	......	....	9	....	3	....	24	....
Massachusetts	......	....	......	....	......	....	......	....	4	....	1	....	5	....
Michigan	125	2	136	....	99	....	52	....	95	....	38	....	545	2
Minnesota	......	....	......	....	......	....	......	....	......	....	......	....	[2] 685	....
Montana	37	....	48	....	59	....	32	....	32	....	......	....	208	....
New Hampshire	......	....	......	....	......	....	......	....	......	....	......	....	[3] 30	....
New Jersey	26	....	2	....	2	....	......	....	3	....	......	....	33	....
New York	7	....	5	....	6	....	5	....	34	....	33	....	90	....
North Carolina	933	....	399	....	303	....	278	....	69	....	82	....	2,064	....
North Dakota	37	....	26	....	7	....	......	....	8	....	11	....	89	....
Ohio	61	....	13	1	49	....	120	....	88	....	75	....	406	1
Oklahoma	234	....	205	1	180	....	219	....	149	....	50	....	1,037	1
Oregon	5	....	1	....	2	....	8	....	10	....	7	....	33	....
Pennsylvania	15	....	5	....	8	....	13	....	37	....	42	....	120	....
Rhode Island	......	....	......	....	......	....	......	....	......	....	......	....	[4] 3	....
South Dakota	77	....	109	....	84	....	96	1	62	....	50	....	478	1
Tennessee	......	....	......	....	96	1	......	....	......	....	......	....	96	1
Texas	117	5	76	3	119	....	134	1	128	....	22	....	596	9
Utah	160	....	151	....	161	1	260	2	154	2	193	....	1,079	5
Virginia	291	....	51	....	115	....	131	....	138	....	33	....	759	....
Washington	87	....	123	....	110	2	138	....	142	....	......	....	600	2
Wisconsin	43	....	53	....	52	....	43	....	70	....	18	....	279	....
Total	3,022	10	2,085	7	2,510	9	2,554	4	1,959	6	1,024	3	15,793	44

[1] Reports are made weekly.

[2] Cases from Dec. 26, 1910, to July 31, 1911.

[3] Jan. 1 to June 8, 1911 (approximate).

[4] June 15 to July 14, 1911.

CHOLERA IN THE UNITED STATES.

The steamship *Germania* arrived at New York on September 26, 1910, with an immigrant who had been under treatment en route for malaria. The immigrant was removed for observation to the quarantine station, where symptoms of cholera developed. The patient died September 29, and bacteriologic examination of the dejecta demonstrated that the case was one of cholera. The vessel had left Naples September 13.

The steamship *San Giorgio* arrived at New York on November 17, 1910, from Naples and Palermo, having departed from the former place on November 1 and from Palermo November 2. On the 7th day of November a woman was taken ill, presumably with seasickness, and with her two children was placed in the ship's hospital. On November 11 one of the children sickened with gastro-enteritis and died within 24 hours. The mother was attacked on the following day, the 12th, and died on November 16 with the same symptoms. Both bodies were buried at sea. The remaining child was upon arrival removed to the quarantine station at New York, where as a result of a bacteriologic examination the patient was found to be suffering from cholera. The family had embarked at Palermo, having resided at Burgio, a town at which cholera was not known to exist. Upon the arrival of the family at Palermo and prior to their embarkation from that port they were isolated for five days and subjected to the usual quarantine restrictions, such as the disinfection of baggage and the destruction of foodstuffs carried.

No other case of cholera arrived at a port of the United States until June, 1911.

The steampship *Berlin* left Naples June 2, 1911, for New York City. A steerage passenger from southern Italy who had embarked at Naples was taken ill on June 6 and died within 30 hours with symptoms typical of cholera. The discharges from this patient were preserved and upon arrival bacteriologic examination was made with the result that the disease was demonstrated to have been cholera.

On June 14 the steamship *Europa*, from Naples, arrived at New York with a patient who had taken ill four days after leaving Naples. The patient was still ill with symptoms suggestive of cholera. An examination of the dejecta in this case also proved the case to be true cholera.

On June 20 the steamship *Duca Degli Abruzzi* arrived at New York with several cases of cholera on board.

In all, from June 14 to August 18, 1911, 24 cases of cholera arrived at ports of the United States on vessels or developed at quarantine among detained immigrants or members of crews of vessels from cholera-infected places, or developed in the United States among immigrants or sailors or those closely associated with them.

Of the 24 case 6 developed on vessels at sea and arrived at New York quarantine ill. The steamship *Europa* brought 1 case, the steamship *Duca Degli Abruzzi* 3, the *König Albert* 1, the *Re d'Italia* 1.

Twelve cases developed at quarantine among detained immigrants and sailors, and 1 case in an employee who had been in contact with infected passengers.

One case developed at Brooklyn, N. Y., and 1 at Auburn, N. Y., both in recently arrived immigrants who had been detained at quarantine for a period of at least 7 days and had been discharged, having passed a longer period under observation without developing symptoms of cholera than that usually required.

One case developed on Staten Island in the person of an employee of the quarantine station; 1 case in New York City in a sailor who had arrived at Boston some days before. One case occurred in Boston in the person of a woman who had associated with recently arrived immigrants.

Of the 22 cases entering by way of New York, including the sailor who had previously arrived at Boston and later come to New York, the nativity was ascertained to have been: Italy in 17, Hungary 1, Greece 1, Spain 1, Germany 1, not stated 1. Fifteen were males and 7 females. As to age, the youngest was 2 years and the oldest 69 years. Sixteen were immigrants and 5 were members of crews. Of the 5 members of crews 2 were firemen, 1 a steward, and 2 sailors. One case, as previously mentioned, was in a quarantine employee.

Of these 22 cases the first developed on the steamship *Europa* on June 5 and arrived at New York June 14. The last developed on the steamship *Re d'Italia* on August 16 and arrived at New York on August 18. All the cases, with the exception of 1, were bacteriologically verified. Nine recovered and 13 died. The probable source of infection of those developing the disease before arriving in the United States was at the port of embarkation 2, and on board the vessel en route 4.

Detailed information of the 22 cases referred to and of cases occurring at sea on vessels bound for the United States is given in the following tables:

Record of cases of cholera arriving at ports of the United States and of cases developing at quarantine and at places within the United States.

RECORD OF CASES.

Case No.	Name.	Age.	Sex.	Nativity.	Date of onset.	Place of onset.	Date of clinical diagnosis.	Diagnosis bacteriologically verified.	Patient removed to—	Termination.		
										Result.	Place.	Date.
		Yrs.			1911.		1911.	1911.				1911.
1	A. T.	23	Male	Italy	June 5	Steamship Europa		June 15	Swinburn Island	Recovery	Swinburn Island	July 18
2	P. L.	3	do	do	June 18	Steamship Duca Degli Abruzzi.		June 20	do	Died	On way to Swinburn Island.	June 20
3	V. P.	23	do	do	June 19	do	June 19	do	do	Recovery	Swinburn Island	July 18
4	M. R.	29	do	do	June 20	do	June 20	do		Died	On steamship Abruzzi.	June 20
5	M. G.	32	Female	do	June 23	Hoffman Island	June 23	do	Swinburn Island	Recovery	Swinburn Island	July 21
6	A. N.	32	do	do	June 30	Brooklyn, N. Y.	July 2	July 2	do	Died	do	July 4
7	T. B.	21	Male	do	do	Auburn, N. Y.	June 30			do	Auburn, N. Y.	July 1
8	E. S.	25	Female	Hungary	July 11	Hoffman Island		July 11	Swinburn Island	do	Swinburn Island	July 16
9	G. M.	18	Male	Italy	July 12	do	July 12	July 12	do	do	do	July 12
10	P. M.	56	do	do	July 13	do	July 13	July 13	do	do	do	July 15
11	L. D.	69	Female	do	do	do	do	do	do	do	do	July 14
12	A. F.	29	Male	do	do	do	do	do	do	Recovery	do	July 31
13	A. J.	2	Female	do	do	do	do	do	do	do		
14	P. C.	33	Male		do	Staten Island	July 14	July 14	St. Vincent Hospital, Swinburn Island.	Died	Swinburn Island	July 15
15	D. A.	14	do	Greece	July 14	Hoffman Island	do	do	Swinburn Island	do	do	July 22
16	G. P.	32	do	Italy	July 15	do	July 15	July 15	do	do	do	July 19
17	F. A.	38	Female	do	July 16	do	July 18	July 18	do	Died	do	July 20
18	G. P.	20	do	do	do	do	July 16	July 16		Recovery		Aug. 4
19	F. F.	15	Male	do	July 15	do	July 15	July 15	Swinburn Island	Died	Swinburn Island	July 17
20	M. B.	33	do	Spain	July 19	New York City		July 22	From Bellevue Hospital to Swinburn Island, July 22.	Clinically recovered.		
21	O. W.	19	do	Germany.	Aug. 4	Steamship König Albert	Aug. 6	Aug. 19	Swinburn Island	Recovery	Swinburn Island	Sept. 10
22	F. M.	52	do	Italy	Aug. 16	Steamship Re d'Italia	Aug. 16	do	do	do	do	Aug. 28

NOTE.—In addition one other case occurred at Boston, July 20, in the person of a woman associated with recently arrived immigrants, and 1 case at New York quarantine in a person who had been in contact with infected passengers.

ITINERARY OF PATIENTS.

Case No.	Probable source of infection.	Whether immigrant or sailor.	Port and date of departure.	Name of vessel.	Itinerary of vessel.	Date of arrival at United States port.
1	Port of embarkation	Immigrant, from Italy	Genoa, May 30, 1911, or Naples, June 1, 1911.	Steamship Europa	Genoa, Naples, New York	June 14, 1911, New York.
2	Aboard the steamship Duca Degli Abruzzi.	do	Genoa, June 6, 1911, or Naples, June 7, 1911.	Steamship Duca Degli Abruzzi.	Genoa, Naples, Funchal, New York.	June 20, 1911, New York.
3		Fireman	do	do	do	Do.
4	Aboard the steamship Duca Dugli Abruzzi.	Fireman, Italy	do	do	do	Do.
5	do	Immigrant, from Italy	do	do	do	Do.
6	Hoffman Island—From case No. 5.	do	do	do	do	Do.
7	do	do	do	do	do	Do.
8	Hoffman Island	Immigrant	Fiume	Steamship Carpathia	Trieste, Fiume, Messina, Palermo, Naples, Gibraltar, New York.	June 6, 1911, New York.
9		Immigrant, from Italy	Naples, June 22, 1911	Steamship Moltke	Genoa, Naples, Palermo, New York.	July 5, 1911, New York.
10		do	Palermo, June 23, 1911	do	do	Do.
11		do	do	do	do	Do.
12		Immigrant	Genoa, June 21, 1911	do	do	Do.
13		Immigrant, from Italy	Palermo, June 23, 1911	do	do	Do.
14	Hoffman Island	Quarantine employee				
15		Immigrant, from Italy	Naples, June 22, 1911	Steamship Moltke	Genoa, Naples, Palermo, New York.	July 5, 1911, New York.
16		do	do	do	do	Do.
17		do	Palermo, June 23, 1911	do	do	Do.
18		do	Naples, June 22, 1911	do	do	Do.
19		do	Palermo, June 23, 1911	do	do	Do.
20	New York City	Sailor	Liverpool	Steamship Teodoro de Larrinaga.	Liverpool, Buenos Ayres, Para, St. Lucia, Boston, New York.	Boston, June 30, 1911.
21	Genoa, Italy	do	Genoa, Aug. 3, 1911	Steamship König Albert	Genoa, Naples, Palermo, Gibraltar, New York.	Aug. 17, 1911, New York.
22	Steamship Re d'Italia	Steward		Steamship Re d'Italia	Genoa, Naples, Palermo, New York.	Aug. 18, 1911, New York.

Cases of cholera occurring and terminating at sea on vessels bound for the United States.

Case No.	Name.	Age.	Sex.	Nativity.	Immigrant or sailor.	Sickened with cholera.	Name of vessel.	Itinerary of vessel.
		Yrs.						
1	B. R.		Male	Italy	Immigrant, from Italy.	At sea, June 6, 1911.	Steamship Berlin.	Genoa, Naples, Gibraltar, New York.
2	J. C.	[1]3	do	do	do	At sea	Steamship Duca Degli Abruzzi.	Genoa, Naples, Funchal, New York.
3	N. W.	16	do	Russia	Immigrant	do	Steamship Laura.	Trieste, Patras, Palermo, Algiers, New York.
4	C. A.		do	Turkey.	do	do	do	Do.
5	H. B.	28	do	Germany	Sailor	do	Steamship Moltke.	Genoa, Naples, Palermo, New York.
6	M. C.	22	do	Greece	do	At sea, July 5, 1911.	Steamship Perugia.	Leghorn, Naples, Palermo, New York.
7	J. J.	24	do	do	Immigrant	At sea	do	Do.
8	N. S.	36	do	Italy	Immigrant, from Italy.	At sea, Aug. 7, 1911.	Steamship Venezia.	Marseille, Naples, Palermo, New York.
9	L. S.	2	Female	do	Immigrant	do	Steamship Re d'Italia.	Genoa, Naples, Palermo, New York.
10	M. A.	2	do	Greece	Immigrant, from Odessa.	At sea, Aug. 6, 1911.	do	Do.
11	A. G.	2	do	Italy	Immigrant, from Salerno	At sea, Aug. 7, 1911.	do	Do.
12					Fireman	At sea, Aug. 16, 1911.	Steamship Europa.	Genoa, Naples, New York.

Case No.	Probable source of infection.	Date of diagnosis	Diagnosis bacteriologically verified.	Precautions taken to prevent spread.	Date of arrival of vessel at United States port.	Vessel detained at quarantine.	Termination of illness.		
							Result.	Place.	Date.
		1911.	1911.		1911.	*Days.*			1911.
1			June 13		June 13	1	Died	At sea.	June 8.
2	At port of embarkation.		June 20		June 20	5	do	do	June 11.
3			June 21		June 21	1	Clinically recovered.	do	
4			do		do	1	do	do	
5			July 5		July 5	2	do	do	
6			July 15		July 15	9	do	do	
7			do		do	9	do	do	
8		Aug. 7	Aug. 12	Placed in isolation hospital; quarters disinfected.	Aug. 11		Died	do	Aug. 8.
9	On board steamship Re d'Italia.	do	([2])	do	Aug. 18		do	do	Do.
	Immigration barracks at Naples.	Aug. 6	Aug. 19	do	do		do	do	Aug. 7
11		Aug. 6	Aug. 29	do	do		do	do	Aug. 11
12		At sea	Aug. 26	All firemen isolated.	Aug. 25	1	do	do	Aug. 23

[1] months.

[2] No specimen submitted.

CHOLERA-BACILLUS CARRIERS.

Because of the discovery that persons coming in contact directly or indirectly with cases of cholera may, without becoming ill themselves, carry the cholera organism in their alimentary tracts and disseminate it through the dejecta, it has been found necessary in the prevention of the spread of the disease to take such measures as will serve to reveal the individuals who have become cholera-bacillus carriers, and to use the same precautions in regard to them as are taken with clinical cases of the disease. In the spread of the disease the carrier is of even more importance than clinical cases. The latter are usually confined to bed and have less opportunity, therefore, for disseminating the infection than the carriers who go about their duties and may come into contact with many individuals.

For the detection of carriers an amendment was made to the Quarantine Regulations, requiring the bacteriologic examination of the dejecta of all immigrants coming to the United States from cholera-infected localities. As a result of this regulation, 27 cholera-bacillus carriers have been detected among immigrants from infected localities, or among those associated with immigrants.

The nativity of 18 of the carriers was given as Italy, 2 as Hungary, 1 as Russia, and 3 as Germany, and of 3 the nativity was not stated. In only 1 of the carriers were clinical symptoms of cholera present at any time. The carriers were detained for periods varying from 8 to 36 days, and until repeated bacteriologic examinations had shown that they had ceased to be carriers.

At Naples and Palermo, and more recently in Genoa, the Italian authorities have been examining emigrants before embarkation to eliminate cholera carriers. During the Autumn of 1910, 1,400 of these examinations were made at Naples and 12 bacillus carriers were found. Up to September 22, 1911, 9,557 examinations were made in Italy for cholera-bacillus carriers, and a total of 41 carriers was found. Most of these examinations took place at Naples, where 40 carriers were discovered. One carrier was found at Palermo.

Detailed information regarding the cholera carriers found at the port of New York is given in the following table:

Record of cholera-bacillus carriers detected at New York quarantine.

CASE RECORD.

Carrier No.	Name.	Age.	Sex.	Nativity.	Cholera vibrios first found in specimen taken.	Location of carrier when vibrios were first found.	Place of detention while a carrier.	Date of last finding of vibrios.	Date of release from detention.	Clinical symptoms of cholera present.
		Yrs.			1911.				1911.	
1	A. P.	30	Male	Italy	July 16	Hoffman Island	Swinburn Island	July 24, 1911	Aug. 7	None.
2	R. L.		do	do	do	do	do	Negative, July 29, 1911	Aug. 4	Do.
3	A. L.	26	do	do	do	do	do	do	do	Do.
4	G. R.	29	do	do	do	do	do	Negative, July 30, 1911	do	Do.
5	S. J.	14	do	do	do	do	do	Negative, July 25, 1911	Aug. 10	Do.
6	M. S.	4	Female	Hungary	July 17	do	do	Aug. 4, 1911		Vomiting, diarrhea, prostration.
7	M. S.	22	do	do	July 18	do		Negative, July 25, 1911	Aug. 10	None.
8	K. L.	26	do	Russia	do	do	Swinburn Island	Negative, July 29, 1911	Aug. 4	Do.
9	G. T.		Male		July 19	do		do		Do.
10	F. C.	20	do	Italy	July 18	do	Swinburn Island	Negative, July 25, 1911	Aug. 4	Do.
11	G. S.	7	do	do	do	do	do	Negative, July 23, 1911	do	Do.
12	A. M. C.	22	Female		July 19	do	Yonkers, N. Y., at hospital	Negative, July 28, 1911	July 21	Do.
13	A. M.	30	Male	Germany	July 20	do	Swinburn Island	Negative, July 25, 1911	Aug. 4	Do.
14	R. L.	19	do	do	July 21	do	do	Negative, July 29, 1911	do	Do.
15	P. P.				do	do	do	Negative, July 25, 1911	do	Do.
16	M. A.	7	Female	Italy	do	do	do	Negative, July 27, 1911	Aug. 12	Do.
17	I. F.	6	do	do	July 22	do	Hoffmann Island, Swinburn Island.	Negative, July 28, 1911	Aug. 4	Do.
18	S. V.	5	Male	do	July 21	do	Swinburn Island	Negative, July 27, 1911	Aug. 12	Do.
19	F. J.	42	do	do	July 22	do	do	Negative, July 26, 1911	do	Do.
20	G. C.		do	do	July 21	do	do	do	Aug. 4	Do.
21	N. S.	29	do	do	do	do	do	do	do	Do.
22	M. B.	22	do	do	do	do	do	do	do	Do.
23	G. A.	18	do	do	Aug. 2	Aboard steamship Duca di Genova.	On vessel and at Swinburn Island.	Negative, Aug. 6, 1911	Aug. 17	Do.
24	F. B.	32	do	do	do	do	Swinburn Island	do	do	Do.
25	I. R.	11	Female	do	Aug. 12	Steamship Venezia and Hoffmann Island.	do	Negative, Aug. 17, 1911	Aug. 28	Do.
26	F. K.	32	Male	Germany	Aug. 17	Steamship König Albert	do	Negative, Aug. 26, 1911	Sept. 1	Do.
27	G. C.	5	do	Italy	Aug. 18	Steamship Re d'Italia	do	Negative, Aug. 23, 1911	Aug. 28	Do.

SOURCE OF INFECTION AND ITINERARY OF PATIENT.

Carrier No.	Probable source of infection.	Immigrant or sailor from—	Port and date of departure.	Name of vessel.	Itinerary of vessel.	Date of arrival at New York.	Time of detention of carrier at quarantine.	Itinerary of patient after leaving quarantine.
1	Hoffmann Island (from Moltke case).	Immigrant, from Naples.	Naples, June 22, 1911.	Steamship Moltke.	Genoa, Naples, Palermo.	1911. July 5	July 7 to Aug. 7, 1911 (31 days).	Ellis Island.
2	do.	Immigrant, from Genoa.	Genoa, June 21, 1911.	do.	do.	do.	July 7 to Aug. 4, 1911 (28 days).	Do.
3	do.	Immigrant, from Naples.	Naples, June 22, 1911.	do.	do.	do.	do.	Do.
4		do.	do.	do.	do.	do.	do.	Do.
5	Hoffman Island (from Moltke cases).	do.	do.	do.	do.	do.	20 days.	Do.
6	From mother (E. S., Case No. 8).	Immigrant, from Fiume.	Fiume.	Steamship Carpathia.	Trieste, Fiume, Messina, Palermo, Naples, Gibraltar, New York.	June 6	33 days+.	Ellis Island, 331 McKennie St., South Bethlehem, Pa.
7	Hoffman Island.	Immigrant.		Steamship Amerika.		July 8	do.	Ellis Island.
8	do.	do.		Steamship Pennsylvania.		July 2	July 2 to July 22, 1911 (33 days).	Do.
9	do.	Kitchen man, employee at Hoffman Island.						
10	do.	Immigrant, from Naples.	Naples, June 22, 1911.	Steamship Moltke.	Genoa, Naples, Palermo.	July 5	July 7 to Aug. 4, 1911 (28 days).	Do
11		Immigrant, from Genoa.	Genoa, June 21, 1911.	do.	do.	do.	do.	
12		do.	do.	do.	do.	do.	July 7 to July 21, 1911 (14 days).	Ellis Island, Yonkers, N. Y.
13	Hoffman Island.	Steward.	do.	do.	do.	do.	July 7 to Aug. 4, 1911 (28 days).	
14	do.	Sailor.	do.	do.	do.	do.	do.	
15	do.	do.	do.	do.	do.	do.	do.	
16	do.	Immigrant, from Genoa.	do.	do.	do.	do.	36 days.	
17	do.	Immigrant, from Naples	Naples, June 22, 1911.	do.	do.	do.	July 7 to Aug. 4, 1911 (28 days).	Ellis Island.
18	do.	do.	do.	do.	do.	do.	July 7 to Aug. 12, 1911 (36 days).	Do.
19	do.	do.	do.	do.	do.	do.	do.	Do.
20	do.	do.	do.	do.	do.	do.	July 7 to Aug. 4, 1911 (28 days).	Do.
21	do.	Immigrant, from Genoa.	Genoa, June 21, 1911.	do.	do.	do.	do.	Do.
22	do.	Immigrant, from Naples.	Naples, June 22, 1911.	do.	do.	do.	do.	Do.
23	Naples (?).	Immigrant, from Italy.	Naples, July 19, 1911.	Steamship Duca di Genova.	Genoa, Naples.	July 30	17 days.	Do.
24		do.	Genoa, July 18, 1911.	do.	do.	do.	do	Do.
25	On board steamship Venezia.	do.	Palermo, July 30, 1911.	Steamship Venezia.	Marseille, Naples, Palermo.	Aug. 11	13 days.	Do.
26	Genoa, or on steamship König Albert.	Fireman.	Genoa, Aug. 3, 1911.	Steamship König Albert.	Genoa, Naples, Palermo, Gibraltar.	Aug. 17	12 days.	
27	On board steamship Re d'Italia.	Immigrant, from Italy.	Naples, Aug. 3, 1911.	Steamship Re d'Italia.	Genoa, Naples, Palermo.	Aug. 18	8 days.	Do

Record of passengers and crews arriving at ports of the United States among whom cases of cholera occurred or cholera carriers were found.

Names of vessels.	Place and date of arrival.	Where from.	Number of—		Cases of cholera on arrival at quarantine.		Number inspected and passed at quarantine.		Number detained at quarantine.		Cases of cholera developing at quarantine.		Number examined for cholera carriers at quarantine.		Number of cholera carriers found.		Dates of discharge from quarantine.				Remarks.
																	Passengers.		Crew.		
			Passengers.	Crew.	Among passengers.	Among crew.	Passengers.	Crew.	Passengers.	Crew.	Among passengers.	Among crew.	Passengers.	Crew.	Passengers.	Crew.	Number.	Date.	Number.	Date.	
Berlin	New York, June 13, 1911.	Genoa, June 1; Naples, June 2; Gibraltar, June 5.	1,211	393	....	....	375	372	836	21	....	....	....	....	....	....	829	June 17	21	June 17	
																	7	(?)			
Europa	New York, June 14, 1911.	Genoa, May 30; Naples, June 1.	440	153	1	....	77	134	363	22	....	....	....	....	....	....	359	June 20	22	June 19	1 stowaway.
																	2	June 19			
																	1	June 26			
																	1	July 18			
Duca degli Abruzzi.	New York, June 20, 1911.	Genoa, June 6; Naples, June 7; Funchal, June 12.	700	189	1	2	65	179	635	10	1	....	....	....	....	....	355	June 27	8	June 26	1 case cholera in passenger died at time of arrival. 1 case cholera in a fireman died in transit to Swinburn Island. 1 case cholera, developed in a passenger while in quarantine, recovered and discharged July 21, 1911.
																	261	June 28	1	July 18	
																	9	June 29			
																	2	July 3			
																	6	July 6			
																	1	July 10			
																	1	July 21			
Laura	New York, June 21, 1911.	Trieste, June 3; Patras, June 5; Palermo, June 7; Algiers, June 9.	433	142	2	....	89	142	344	....	....	....	....	....	....	....	341	June 27	....	....	2 passengers were sent to Hoffmann Island June 23, 1911, and 342 passengers (steerage) were en route to Ellis Island (June 23) when they were ordered to return to quarantine for detention.
																	1	July 3			
																	2	July 14			
Moltke	New York, July 5, 1911.	Genoa, June 21; Naples, June 22; Palermo, June 23.	367	282	....	1	155	231	212	[1]51	[2]11	....	201	51	15	3	25	July 21	1	July 10	46 members of crew who had signed on at New York and were to be discharged from vessel were removed to quaran-
																	19	July 22	6	July 14	
																	91	July 26	1	July 18	
																	46	July 27	20	July 21	

																	2 2 10 1 2 3	July 29 July 31 Aug. 4 Aug. 7 Aug. 10 Aug. 12	19 (3) (4) 4	July 22 July 22 July 25 Aug. 4	tine for observation to complete 10 days. 1 stowaway was landed and 1 deported.
Perugia........	New York, July 15, 1911.	Leghorn, June 25; Naples, June 29; Palermo, June 30.	263	92	1	1	4	....	259	[4]91	....	....	257	[4]30	....	....	247 2 10	July 24 July 25 July 29	91 (4)	July 24 July 24 July 25	
Duca di Genova.	New York, July 30, 1911.	Genoa, July 18; Naples, July 19.	617	188	....	....	71	....	546	188	....	....	546	1	2	....	544 2	Aug. 8 Aug. 17	188	Aug. 8	The 2 passengers discharged Aug. 17 were the cholera carriers, who by that date had ceased to harbor the vibrio of cholera.
Venezia.........	New York, Aug. 11, 1911.	Marseille, July 25; Naples, July 29; Palermo, July 30.	698	109	....	....	17	....	681	109	....	....	681	93	1	....	533 147	Aug. 18 Aug. 21	103 6	Aug. 15 Aug. 21	Steerage passenger found to be carrier Aug. 15; removed to Swinburn Island. 1 steerage passenger taken sick at sea Aug. 7, died Aug. 8. 1 passenger still under detention Aug. 26, 1911.
König Albert....	New York, Aug. 17, 1911.	Genoa, Aug. 3; Naples, Aug. 4; Palermo, Aug. 5; Gibraltar, Aug. 8.	601	232	....	1	242	....	359	232	....	....	359	190	....	1	359	...do.....	178 53	...do..... Aug. 24	The cholera case developed in a member of crew arrived at Genoa on a vessel direct from Bremen. On shore at Genoa once. Taken ill Aug. 4. The cholera carrier was confirmed Aug. 20. 1 member of crew still at Swinburn Island Aug. 24.
Ré d'Italia......	New York, Aug. 18, 1911.	Genoa, Aug. 2; Naples, Aug. 3; Palermo, Aug. 4.	355	134	....	1	96	....	259	134	....	....	259	122	1	....	253	Aug. 26	128 5	Aug. 21 Aug. 26	The case of cholera was in a steerage steward who had contact with cases which occurred on voyage. 3 deaths from cholera occurred on voyage, Aug. 7, 8, and 11. All children. Diagnosis in 1 of these fatal cases confirmed bacteriologically. 6 passengers at Swinburn Island still under detention Aug. 26, 1911. 1 stowaway discharged Aug. 26.
Europa.........	New York, Aug. 25, 1911.	Genoa, Aug. 9; Naples, Aug. 12.	450	149	....	....	104	....	346	149	....	....	346	126	....	....	346	...do.....	147	...do.....	A fireman died at sea Aug. 23 of cholera. He had embarked at Genoa Aug. 7.

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[1] Five July 7; 46 and 2 stowaways July 11.

[2] 8 died, 3 recovered. Date of discharge not given.

[3] 1 stowaway.

[4] 3 stowaways.

Cholera in Foreign Countries.

Cholera is believed to be always present in certain localities in Asia. From these permanent endemic areas it spreads from time to time to other localities in Asia, and occasionally to other parts of the world. In many of the places to which it is thus carried it establishes foci and becomes temporarily endemic, remaining so for periods which vary in duration depending upon the climatic and sanitary conditions, and possibly other factors. For several years cholera has been present in Russia and at times small localized outbreaks have appeared in other countries of Europe. During the past year (July 1, 1910, to June 30, 1911) local outbreaks have occurred in Europe in Austria-Hungary, Bulgaria, France, Germany, Roumania, Servia, and Turkey. In Italy the disease has been epidemic. Since July 1, 1911, cases of the disease have occurred in Greece, Montenegro, and Spain in addition to the above named countries.

In Asia cholera has been present during at least part of the year in Arabia, China, Ceylon, Federated Malay States, India, Indo-China, Japan, Java, Korea, Manchuria, Persia, Siam, Straits Settlements, Sumatra, and Turkey. In Africa cases were reported in Tripoli and Tunis. The disease has also been present in Madeira and the Philippine Islands, and a limited outbreak occured at Honolulu. Hawaii.

AUSTRIA-HUNGARY.

Cholera appeared in Austria-Hungary during August, 1910. In Hungary from August 19 to November 26 there were reported 386 cases with 187 deaths. In Vienna there were 9 cases from August 21 to September 24. On October 12, 1910, fifty-two localities in Austria-Hungary were reported to be infected with cholera. In May, 1911, cholera appeared at Trieste and other points, and up to September 17 there had been 73 cases with 30 deaths in all.

BULGARIA.

In Bulgaria there were three cases of cholera at Varna between November 15 and 28, 1910, and two cases at Tartar-Pazardjik January 10, 1911. Two imported cases also occurred at Varna during July, 1911.

FRANCE.

On October 4, 1910, a case of cholera occurred at Marseille in an immigrant who had arrived September 27 from Greece. The first case was discovered in a lodging house. Later 3 more cases occurred in persons who had been in contact with the first case.

In June, 1911, cholera again appeared at Marseille. By the end of August 38 cases were reported in the city, and to August 23, 95 cases in an asylum.

GERMANY.

During August and September, 1910, cases of cholera occurred in Germany at Freiburg, Kalthoff, Marienburg, Sommerau, and Spandau, a total of 31 cases being reported.

GREECE.

During July, 1911, three cases of cholera occurred at Laurium in Greece, the first case being from a vessel arriving via Naples.

HAWAII.

From February 25 to March 14, 1911, 31 cases of cholera were reported in Honolulu with 22 deaths. No further cases appeared until April 12. From April 12 to 25 there were 8 cases with 7 deaths. Since the latter date no case has occurred. The infection was probably imported by a cholera carrier.

ITALY.

August 17, 1910, cholera was reported present in Italy in the Provinces of Bari and Foggia. The origin of the infection was attributed to a band of Russian gypsies from Batum who had landed at Brindisi and proceeded by rail to Trani, the latter place being regarded as the primary focus of the epidemic. Whether any of the wanderers were ill upon arrival admits of doubt, but it is certain that arriving at Trani they washed clothing in vessels used for drawing water from a well, and in due course there followed cases of a disease, the nature of which was not immediately recognized. These cases were regarded by the authorities as "grave gastro-intestinal disturbances." They were later found to be cholera. The infection spread to various towns and cities in the Provinces of Bari and Foggia, both in the compartment of Apulia.

The disease spread throughout southern and eastern Italy and invaded Sicily. It continued until the advent of cold weather and subsided in January, 1911, to reappear again in June, since which date it has been prevalent. From August 17, 1910, to January 30, 1911, 1,840 cases with 804 deaths were recorded.

The epidemic of 1911 has been much more extensive than that of 1910. From June 8 to September 23, 1911, 14,031 cases with 5,281 deaths were reported, and the disease had extended to some extent into northern Italy.

Cholera in Italy.

Provinces.	Cases.	Deaths.
Aug. 17, 1910, to Jan. 30, 1911.		
Aquila	4	1
Avellino	7	2
Bari:		
Andria	41	29
Barletta	167	102
Bisceglie	4	2
Bitonto	3	1
Canosa	10	2
Carbonara	1	1
Grumo Appula	1	
Molfetta	80	29
Ruvo	4	1
Spinazzola	15	8
Terlizzi	2	
Trani	93	71
Triggiano	1	
Caltanisetta	7	3
Campobasso	7	2
Caserta	328	187
Catanzaro	2	2
Foggia:		
Cerignola	38	30
Margherita di Savoia	24	24
Ortanova	4	2
San Ferdinando	15	15
Trinitapoli	55	30
Aug. 17, 1910, to Jan. 30, 1911—Continued.		
Lecce	126	23
Messina	1	1
Naples (exclusive of city of Naples)	193	41
Naples	329	131
Palermo:		
Palermo	86	22
Perugia	3	
Potenza:		
Genzano	2	1
Palazzo San Gervaso	1	1
Rome (exclusive of city of Rome)	76	9
Rome	39	17
Salerno	38	10
Sicily:		
Catania	16	
Girgenti	8	1
Monreale	1	
Trapani	3	2
Sardinia	5	1
Total	1,840	804

Cholera in Italy—Continued.

Provinces.	Cases.	Deaths.
June 8 to Sept. 23, 1911.		
Alessandria	114	33
Aquila	109	49
Avellino	206	74
Bari	271	55
Benevento	96	24
Bergamo	43	8
Bologna	26	5
Cagliari	114	39
Caltanisetta	190	37
Campobasso	707	268
Caserta	1,776	679
Catania	756	333
Catanzaro	137	62
Chieti	108	45
Casoria	125	37
Cosenza	104	52
Ferrara	26	14
Florence	4	1
Foggia	179	88
Forli	36	16
Genoa	390	119
Genoa, city	263	130
Girgenti	126	49
Lecce	88	28
Leghorn	767	380
June 8 to Sept. 23, 1911—Con.		
Lucca	10	3
Massa	66	39
Messina	128	40
Milan	19	6
Naples (exclusive of city of Naples)	1,332	563
Naples, city	936	269
Padua	7	3
Palermo (exclusive of city)	436	210
Palermo, city	1,408	443
Pesaro	100	41
Pisa	17	8
Potenza	55	13
Reggio di Calabria	7	4
Reggio Emilio	1	....
Rome	182	92
Rovigo	47	10
Salerno	1,339	343
Sassari	1	....
Syracuse	84	18
Teramo	5	5
Trapani	197	105
Venice	204	66
Total	14,031	5,281

JAPAN.

During September, October, and November, 1910, cholera appeared in various localities in Japan, there being from September 14 to November 30, 2,770 cases reported with 1,923 deaths.

MADEIRA.

During the autumn of 1910 cholera appeared in Madeira. Infection was limited to the districts of Funchal, Camara dos Lobos, Ponto do Sol, Machico, and Santa Cruz. The total from November 16, 1910, to February 8, 1911, was 1,774 cases with 555 deaths. (Population of Madeira is approximately 108,300.)

On February 24, 1911, Funchal was officially declared free from cholera.

MONTENEGRO.

Two cases of cholera were reported July 29, 1911, at Cettinje.

PHILIPPINE ISLANDS.

Outbreaks of cholera occurred in various Provinces of the Philippine Islands during the summer of 1910, and to a less extent since that date.

From July 1 to December 31, 1910, there were reported in the Provinces 6,233 cases of cholera with 4,501 deaths, and in Manila 217 cases with 152 deaths. From January 1 to March 31, 1911, 199 cases with 160 deaths were reported in the Provinces and none in Manila.

ROUMANIA.

A case of cholera occurred September 16, 1910, at Galatz in the person of an Italian seaman, one case October 5, 1910, at Tulcea, and three cases September 14, 1911, at Braila.

RUSSIA.

Cholera has for several years been epidemic in Russia, excepting during the colder months of winter. In 1908, 17,000 deaths from this disease were officially recorded; in 1909, 28,000. From May 8, 1910, to February 4, 1911, there were recorded 216,796 cases, with 100,982 deaths. During 1910 practically all parts of Russia were invaded, excepting the northernmost Provinces.

The disease reappeared in April, 1911, and up to September 13 there had been 2,003 cases with 1,018 deaths reported. The official reports indicate that the disease so far this year (1911) is very much less prevalent than during 1910.

Cholera in Russia.

Governments and territories.	Cases.	Deaths.
May 8, 1910, to Feb. 4, 1911.		
Akmolinsk	723	437
Amur	141	99
Archangel	4	3
Astrakhan	1,794	797
Baku	2,118	1,001
Batum	16	8
Bessarabia	112	45
Black Sea Province	504	163
Courland	5	
Cronstadt	230	125
Daghestan	1,566	571
Don	24,008	3,223
Erivan	1,072	580
Esthonia	1	
Ferghana	106	76
Finland	3	
Kaluga	21	3
Kars	707	306
Kazan	1,974	856
Kharkov	2,664	1,117
Kherson	8,843	4,773
Kief	3,428	1,363
Kostroma	1,880	757
Koutais	407	286
Kuban	49,607	10,280
Kursk	5,373	2,116
Livonia	78	34
Lublin	31	13
Minsk	506	170
Mohilev	234	104
Moscow	199	90
Nikolajev	38	19
Nizhni Novgorod	1,797	788
Novgorod	14	6
Olonetz	26	9
Orel	452	173
Orenburg	2,962	1,499
Orlov	22	8
Podolia	1,135	460
Pensa	401	138
Perm	685	231
Poltava	2,959	1,211
Pskov	6	1
Rjasan	2,024	856
St. Petersburg	4,911	2,053
Samara	10,257	4,662
Sarapul	1,048	556
Saratov	6,038	2,527
Semipatinsk	15	6
Siberia	282	248
Simbirsk	3,481	1,722
Smolensk	77	34
Stavropol	3,903	1,883
Syr Darya	156	94
Tambov	4,238	2,055
Taurida	4,627	2,263
Terek	1,257	656
Tiflis	1,721	637
May 8, 1910, to Feb. 4, 1911—Continued.		
Techernigov	1,216	448
Tobolsk	146	74
Tomsk	329	132
Transbaikal	26	20
Transcaspian	27	27
Transcaucasia Novorossysk	7	6
Tula	34	10
Turgai	96	49
Tver	33	9
Ufa	590	362
Ural	177	115
Vitebsk	317	142
Voronezh	4,567	2,140
Viatka	305	160
Vladimir	25	16
Volhynia	47	25
Vologda	195	114
Warsaw	28	28
Yaroslav	1,159	619
Yekaterinoslav	14,983	6,931
Yelisavetpol	120	87
Total	216, 96	100,982
Apr. 21 to Sept. 13, 1911.		
Astrakhan	435	181
Baku	12	3
Bessarabia	2	
Daghestan	27	
Don	9	2
Jaroslav	8	3
Kazan	4	2
Kherson	3	
Kuban	2	2
Minsk	4	1
Moscow	2	1
Nizhni Novgorod	1	
Novoryssik	12	4
Odessa	2	1
Poltava	1	
Perm	1	1
Rostov on Don	42	13
Samara	747	407
Saratov	179	75
Siberia—Omsk	2	
Simbirsk	89	49
Stavropol	7	1
Tambov	19	9
Tver and Kursk	1	
Vilna—Disna	1	
Vitebsk	2	1
Voronezh	5	4
Yekaterinislav	2	1
Zarizyn	1	1
Total	2,003	1,018

SERVIA.

Cholera appeared in Belgrade during October, 1910, and by November 8, 10 cases had been reported. One case also occurred at Passarowitz during the same period. It again appeared at Belgrade during September, 1911.

SPAIN.

During August, 1911, cases of cholera were reported in Spain in the Province of Tarragona.

TURKEY.

During the autumn of 1910, cholera was present in Adrianople and Constantinople in Turkey in Europe. In Turkey in Asia it was prevalent in many localities. In Constantinople it again appeared in May, 1911, and later at other points in European Turkey. The disease continues widely prevalent in Asiatic Turkey.

YELLOW FEVER.

During the year no case of yellow fever has been reported in the United States, and no severe epidemic of the disease has been reported abroad. This result is probably at least in part due to a more exact knowledge of the means by which the disease is disseminated and to the greater attention given to measures for preventing its spread.

In South America the disease was present at some time during the year (July 1, 1910, to June 30, 1911) in Brazil at Bahia, Ceara, Manaos, Para, Pernambuco, and Rio de Janiero; in Ecuador at Babahoyo, Bucay, Duran; in Venezuela at Caracas, La Guaira, Macuto, Maiquetia, Puerto Cabello, and Valencia.

In Central America cases were reported in Costa Rico at Limon, in San Jose, and Siquires, and in Honduras at Puerto Cortez.

In North America the disease was reported in Mexico at Campeche, Frontera, and Salina Cruz.

In the West Indies yellow fever is reported to have been present at Santiago de las Caballeros in the Dominican Republic, at Barbadoes, and in Grenada at Victoria.

In Africa yellow fever was reported in Sierra Leone at Freetown and Sherboro, on the Gold Coast at Accra and Sekondi, in Gambia at Bathhurst, in the Bissagos Islands at Bullama, and in Portuguese Guinea.

During the past year it has been established that yellow fever is a disease which has been present in western Africa for many years. From the investigation of an English commission it appears that yellow fever has in the past been one of the principle causes of the mortality on the African Gold Coast; that this disease has in Africa been confounded with malaria and other diseases; that the disease is endemic in western Africa and that natives are in a large measure immune. The immunity of the natives accounts for the comparatively few cases occurring among them. There are reasons for believing that the disease has been epidemic in this part of Africa for at least the last hundred years. While the natives, being largely immune, suffer but little, the white population pays a heavy toll to the disease. The outbreaks have been small because of the limited number of nonimmune white residents exposed at any of the centers of infection.

PLAGUE.

There are certain localities in central Asia in which plague is believed to be permanently endemic. In 1894 the disease began to appear in other places, the infection presumably having spread from the endemic areas referred to. The spread of the disease has continued and for some time it has been pandemic with the result that in various parts of the world secondary endemic foci have been established in which the infection has involved the rodents and secondarily man. During the past year (July 1, 1910, to June 30, 1911) human cases of the disease have been reported in the following countries:

Arabia, Azores, Brazil, British East Africa, British Egyptian Sudan, Chile, China, Ecuador, Egypt, England, German East Africa, Hawaii, India, Indo-China, Japan, Java, Mauritius, Morocco, New Caledonia, New Zealand, Persia, Peru, Portugal, Portuguese East Africa, Russia, Siam, Straits Settlements, Trinidad, Tunis, Turkey in Asia, United States, Venezuela, and Zanzibar.

UNITED STATES.

During the year plague continued to be found among ground squirrels in California and 1 case of the disease occurred in man in the same State.

For a detailed account of plague in the United States see elsewhere in this report.

HAWAII.

In Hawaii there were 4 cases of plague at Honakaa between December 17, 1910, and April 20, 1911. At Honolulu there were 2 cases betwen July 5 and 12, 1910. No case of human plague has been reported in the Territory of Hawaii since April 20, 1911. The collection and examination of rats as a means of determining when plague is present among rodents has been continued.

ENGLAND.

On October 2, 1910, the medical officer of health of the Samford rural district reported 4 cases of pneumonic plague at Freston in east Suffolk, England. During the winters of 1906–7 and 1909–10 there had been outbreaks of a disease in east Suffolk, which after the discovery of the cases in the autumn of 1910 appeared possibly to have been plague. The investigation inaugurated after the discovery of human plague at Freston led to an examination of the rodents in the neighborhood, with the result that a number of plague-infected rats and rabbits were found. Further investigation to find the extent of this infection showed that rodents over a somewhat extensive area were involved. The four deaths from plague were reported October 2. The first infected rat was found October 8, and from that date to November 10 infected rats and a few infected rabbits were found in eight sanitary districts. Measures were immediately taken for the extermination of rodents in these and adjoining districts.

While it is impossible to definitely ascertain the means by which the infection had been imported into England, it was presumed that infected rats had been brought in on vessels carrying grain from plague-infected countries. The report upon the outbreak stated that there are reasons to believe that plague has existed among rodents in east Suffolk for several years.

Plague-infected rats have also been found in London along the water front in the neighborhood of the docks. So far as known the extent of this rat infection has not been determined.

MANCHURIA.

In addition to the presence of the ordinary bubonic type of plague in various parts of China, an unusually virulent outbreak of the pneumonic form of the disease occurred in Manchuria, and to a lesser extent in the contiguous Provinces.

On October 25, 1910, the attention of the Russian railway officials at Manchouli, Manchuria, was called to 2 Chinese ill with symptoms of pneumonia. During the night 1 of the patients died, and as the result of an autopsy and bacteriologic examination the presence of the plague bacillus was determined. On the same day 9 Chinese were found dead of the disease. From these cases the disease seems to have spread with unusual rapidity, and by March 29, 1911, 42,756 deaths had been reported in Manchuria from the disease. The infection was of marked virulence, and so far as can be ascertained there were few authentic cases of recovery.

Plague is believed to be endemic among the tarbagans, a marmot found in Siberia, Thibet, and Mongolia, which is hunted by the Chinese for its fur. This animal is supposed to have been the source of the Manchuria infection, the first cases of the disease having appeared among the tarbagan hunters.

While the bubonic type of the disease is contracted by man from rodents through the agency of fleas, the pneumonic form, which occurred in Manchuria, appears to have been directly transmissible from man to man. The rats did not seem to be involved, and it is understood that no plague-infected rat was found.

In Fuchiatien, Manchuria, 1,100 bodies of persons dead of plague were burned on January 30; 350 on February 1; and 2,100 on February 3. This was the means adopted for the disposal of bodies of those dead of plague. A large number of houses in which cases had occurred were also burned, including one entire section of the town.

Available accounts of the Manchuria epidemic narrate instances in which Chinese villages invaded by the disease were completely depopulated, no one being left living.

PORTUGAL.

During October and November, 1910, a few cases of bubonic plague were discovered in the Alfama quarter of Lisbon. These cases occurred in a bakery. The first victims were two youths who had worked on board steamships as boiler cleaners. The first fell ill on October 24 and the second on October 30. Other cases followed. Previous to the onset of the disease in the youths many dead mice had been noticed on the premises. Following the discovery of these cases many rats were collected and bacteriologically examined, but none was found plague infected. In all there were nine human cases with two deaths between October 24 and November 8.

CEREBROSPINAL MENINGITIS IN GREECE.

Cerebrospinal meningitis is supposed to have first made its appearance in Greece in 1843. From that date to 1868 the appearance of sporadic cases occurred in various districts.

During the winters of 1868 and 1869 there was a marked epidemic of the disease, after which it gradually disappeared, and for several years only a few cases occurred from time to time. Since the year 1881 the disease seems to have been more or less epidemic, the greatest number of cases being reported during the colder months of winter and spring. In November, 1910, an epidemic broke out in Athens and gradually spread throughout Greece. It reached its maximum in February, then gradually subsided. During the course of the epidemic it was found advisable to close the schools in Athens, where, although physicians are not obliged to report cases under their care, 400 cases in all were officially reported.

MARINE HOSPITALS AND RELIEF.

RELIEF TO SEAMEN.

During the fiscal year 52,209 seamen were treated at the various stations of the service. Of these 15,442 were treated in hospitals and 36,767 were treated as out patients. The total number of days' hospital relief furnished seamen was 452,723.

One thousand and three seamen from foreign vessels were treated. The total number of days' hospital relief furnished these seamen was 13,232.

RELIEF STATIONS.

The service operated 23 hospitals, all of which are owned by the Government, and maintained 120 other relief stations where hospital and dispensary relief were furnished.

During the year new relief stations of the third class were established at Bay City, Mich., and Morgan City, La., and the relief station at Houghton, Mich., was abolished. The relief stations at Ellsworth and Bath, Me., were reduced from stations of the third class to stations of the fourth class and placed in charge of customs officers, the services of the acting assistant surgeons being discontinued, this order taking effect July 1, 1911.

RELIEF TO NATIVES OF ALASKA.

The medical officers of the service detailed to vessels of the Revenue-Cutter Service cruising in Alaskan waters furnished medical and surgical relief to many natives requiring the same at various ports visited.

AID TO OTHER BRANCHES OF THE GOVERNMENT.

Revenue-Cutter Service.—Twelve hundred and eighty-five men were examined physically, of whom 200 were rejected.

Steamboat-Inspection Service.—Eleven hundred and seventy-six pilots were examined as to visual capacity, of whom 52 were rejected.

Life-Saving Service.—Nineteen hundred and thirty-two keepers and surfmen were physically examined, of whom 78 were rejected.

Four hundred and fifty disability certificates, referred by the General Superintendent of the Life-Saving Service, were acted upon. These called for the expression of opinion upon the medical evidence of disability submitted in claims for benefits under the act of March 4, 1882; upon the physical fitness of keepers and surfmen for enlistment, reenlistment, promotion and retention, and upon evidence of death submitted by widows or orphans in their claims for benefits.

Seventeen acting assistant surgeons were continued on duty for the examination of keepers and surfmen at points not easily accessible to regular officers at stations of the service. In addition, two medical officers were detailed during July, 1911, at the request of the general superintendent, to various points along the eastern coast for the purpose of examining candidates for reenlistment.

Coast and Geodetic Survey.—Fifty-seven employees and applicants for appointment were examined, and 11 were rejected.

Lighthouse Service.—Sixty-three applicants for enlistment were examined, and 9 were rejected.

Immigration Service.—One hundred and thirty-eight persons connected with the Immigration Service were physically examined, and 14 were rejected.

Civil Service Commission.—One hundred and thirty-four applicants for appointment were physically examined, and 10 were rejected.

Isthmian Canal Commission.—Thirty employees and applicants for appointment were physically examined. None were rejected.

Post Office Department.—In addition to the above, upon the request of the Postmaster General, physical examinations were made at different places in the country of 15 railway mail clerks, with a view to determining whether they were afflicted with tuberculosis.

PHYSICAL EXAMINATION OF MERCHANT SEAMEN.

Physical examinations were made of 400 American merchant seamen, of whom 28 were rejected, and 18 foreign seamen, of whom 4 were rejected.

PHYSICAL EXAMINATIONS, PHILIPPINE ISLANDS.

Physical examinations were made of 20 applicants in the United States to serve in the Islands, of which number 1 was rejected.

Purveying Depot.

The following statistics show the transactions of the purveying depot during the fiscal year:

SUPPLIES PURCHASED.

Drugs and chemicals	$14,561.87
Surgical instruments and appliances	10,990.96
Beds and bedding	8,559.52
Dry goods	4,789.32
Pharmacal implements, etc	4,442.70
Rubber goods	2,441.09
Books and journals	1,328.35
Alcohol, wines, etc	1,073.16
Flags	501.75
Packing boxes and sawdust	437.80
Bacteriological supplies	294.23
Total	49,420.75

CREDIT.

By bills paid direct from funds:		
Quarantine service	$909.89	
Care of seamen	670.41	
Maintenance	428.50	
Bureau	372.30	
Leprosy	236.95	
Epidemic fund	81.33	
		2,699.38
Total		46,721.37
By amounts reimbursed from other appropriations for supplies issued from stock:		
Quarantine service	1,862.31	
Epidemic fund	181.68	
Smithsonian Institution	4.40	
		2,048.39
Net expenditures chargeable to appropriations for purveying depot (in amount $45,000)		44,672.98
Salaries	6,040.00	
Rent	3,250.00	
Operating expenses	320.76	
		9,610.76
Total net expenditures		54,283.74
Number of requisitions filled		288
Number of packages shipped		3,807
Total weight of supplies shipped pounds		294,386

TUBERCULOSIS SANATORIUM AT FORT STANTON, N. MEX.

Passed Asst. Surg. H. S. Mathewson, in charge, reports as follows regarding the transactions of the sanatorium for the fiscal year ended June 30, 1911:

ADMISSIONS.

During the year admissions of patients to the sanatorium numbered 168 as compared with 149 for the previous year. There were under treatment July 1, 1911, 178 as compared with 154 under treatment July 1, 1910.

The comparative condition of patients on arrival here for the past three years shows a gain in percentage of those arriving in good or fair condition, and it is believed that application for relief is made earlier owing to a wider dissemination of information in regard to the onset of tubercular disease of the lungs, also the elimination in part of cases unsuitable for transfer has diminished the number of those arriving here in bad general condition.

Condition of patients on arrival for past three years is as follows:

	1909	1910	1911
Good	46	30	50
Fairly good	20	18	13
Fair	70	62	59
Poor	61	34	42
No examination	1	3	3
Nontubercular (lungs)	7	2	1
Totel	205	149	168

Deaths within 30 days of arrival have this year numbered 5. Four of these died of acute dilatation of the heart. All of these were far advanced cases with cavitation and fibrosis of the lungs; the limitation of the air space was marked. In none was there disease of the heart, the dilatation being caused by the increased work thrown upon the heart by transfer to this altitude.

TENT HOUSE, CLASS B.

During the year the conversion of canvas-covered tent houses to tent houses, class B, equipped with a permanent roof, has been continued, 54 tent houses, class B, being now in use. Materials are on hand or coming in to rebuild 21 additional tent houses, class B, it being thought that 75 of these will suffice for the needs of the station at present.

REPAIRS TO BUILDINGS.

Recommendation previously made that the station be furnished with an amusement building, equipped with pool and billiard tables and box ball and shuffleboard alleys, is again repeated.

During the year the work of rebuilding tent houses, class B, has been continued, 22 having been rebuilt. The station is now equipped with 54 tent houses of this class. General repairs to buildings and plumbing have been made during the year by the carpenter, plumber, and painter, as needed. The work of installing steam heat in buildings Nos. 1, 2, 3, and 13 is underway and will be completed in part or entire before the onset of winter.

PROFESSIONAL WORK.

The professional work of the sanatorium has been conducted satisfactorily during the year. The serious nature of tuberculosis is well shown by the condition of the 144 cases discharged during the year. In 72, or exactly 50 per cent, the condition on discharge was apparently cured, arrested, or improved, while in the other 50 per cent the patient either died or was unimproved in condition.

One of the most difficult problems in the conduct of the sanatorium is the determination of fitness for discharge in those patients who consult us and desire to follow advice as to the length of their stay. During the past two years 41 patients have been readmitted to the sanatorium, and the question arises as to whether a more prolonged treatment here would not be productive of a more permanent result. At present patients considered apparently cured or arrested are encouraged to take the work test here for a few months before leaving. In this way certain cases are proved unfit for discharge, and we are enabled to continue treatment until a permanent result is secured.

One of the most valuable adjuncts to the professional treatment of the consumptive is the furnishing of mental diversion. The few patients on the station who are able to perform light duties are probably benefited more by the mental diversion thus furnished than by the physical exercise involved. During the year the station has been furnished with a projectoscope, and entertainments are frequently given in the hall, both of moving pictures and stereopticon pictures.

STATISTICS.

Patients under treatment July 1, 1910	154
Patients admitted during the year	168
	322
Patients under treatment July 1, 1911	178
Patients discharged during the year	144
	322

Ages of patients treated during the year:	
Under 25 years	48
Between 25 and 34 years	134
Between 35 and 44 years	76
Between 45 and 54 years	47
Over 54 years	14
Nontubercular (lungs)	3
	322

Heredity in patients treated during the year:

History of tuberculosis in parents	41
No history of tuberculosis in parents	239
History of tuberculosis in parents, doubtful	15
History of parents not known	24
Nontubercular (lungs)	3
	322

State of disease of patients admitted:

Incipient	22
Moderately advanced	47
Far advanced	95
No examination	3
Nontubercular (lungs)	1
	168

General condition on arrival:

Good	50
Fairly good	13
Fair	59
Poor	42
No examination	3
Nontubercular (lungs)	1
	168

Tubercle bacilli in sputum:

Were found in	146
Were not found in	18
No examination	3
Nontubercular (lungs)	1
	168

Record of pulmonary hemorrhages of patients admitted:

Before arrival only	51
After arrival only	1
Both before and after arrival	10
Neither before nor after arrival	68
Streaked sputum	34
No examination	3
Nontubercular (lungs)	1
	168

Greatest number of patients under treatment at one time during the year	194

Condition of 144 patients at time of discharge:

Apparently cured	23
Arrested	26
Improved	23
Unimproved	28
Died	41
Discharged cases nontubercular (lungs)—	
Unimproved	1
Died	2
	144

Duration of stay and character of cases.

Character of case.	Longest stay.			Shortest stay.		Average stay.		
	Y.	*Mos.*	*dys.*	*Mos.*	*dys.*	*Y.*	*mos.*	*dys.*
Apparently cured	8	2	28	2	33	1	2	3
Arrested	5	9	11	1	16	1	8	21
Improved	2	2	13		13		8	14
Unimproved	4	8	4		15		9	21
Death	5	0	9		6	1	3	10

Does not include 3 nontubercular (lungs) cases.

List A.—*Patients discharged who were under treatment at beginning of fiscal year.*

	Apparently cured.	Arrested.	Improved.	Unimproved.	Died.	Total.
Incipient	1			1		2
Moderately advanced	9	11	3	6	7	36
Far advanced	4	10	5	4	18	41
Cases discharged	14	21	8	11	25	79

List B.—*Patients discharged who were admitted during the year.*

	Apparently cured.	Arrested.	Improved.	Unimproved.	Died.	Total.
Incipient	7	1	3	2		13
Moderately advanced	1	1	9	5	2	18
Far advanced	1	3	3	10	11	28
Cases discharged	9	5	15	17	13	59

No examination of three patients, all of whom died.
Lists A and B do not include 3 nontubercular (lungs) cases.

Patients under treatment July 1, 1910	154
Patients discharged during the year from these	79
Patients remaining from these	75
Nontuberbular (lungs) cases discharged	2
Patients admitted during the year	168
Patients discharged during the year from these	62
Patients remaining under treatment from these	106
Nontubercular (lungs) cases discharged	1

Length of time under treatment at sanatorium of the 144 discharged cases:

Over 2 years	26
Between 1 and 2 years	28
Between 6 and 12 months	33
Between 3 and 6 months	27
Under 3 months	27
Nontuburcular (lungs)	3
	144

Patients discharged during the year under treatment for less than 30 days:

Improved	1
Unimproved	2
Died	5
	8

Cause of death of 43 patients dying during the year:

Tuberculosis lungs	41
Other causes	2
	43

During the year there were under treatment, in addition to the above, tuberculous officers and employees as follows:

Under treatment July 1, 1910	12
Admitted during the year	7
	19
Remaining under treatment June 30, 1911	13
Discharged during the year	6
	19

Condition of tuberculosis officers and employees at time of discharge:

Arrested	3
Unimproved	2
Died	1
	6
Number of physical examinations made during the year	1,177

The routine work in the laboratory during the fiscal year included the following:

Examination of sputum for tubercle bacilli	1,495
Examination of stools for tubercle bacilli	197
Examination of stools for parasites	25
Examination of urine	829
Doses of autogenous vaccines (nontuberculous) prepared and administered	55
Specimens of milk tested for butter fat	376

WATER SUPPLY.

During the entire year under review the station has been supplied with water by pumping, the gravity supply from the Bonito being out of use owing to lack of water in the Bonito. In February, 1911, a heavy fall of snow occurred in this valley and water appeared in the Bonito at the brewery gate on March 5; on March 12 this water reached the alfalfa field and irrigation of alfalfa was begun. The snowfall of February has been supplemented by early rains, and water for irrigation of the garden, orchard, and alfalfa fields has been available at intervals during the spring months. At no time has the flow in the Bonito been constant enough to make it worth while to attempt to put the gravity water supply system of the station into operation. Rain during June has fallen over the entire range, and the prospect for a good year on the ranch seems assured. One gravity water station has been equipped in the southeast corner of the reservation by utilizing a well dug many years ago by a goat herder. This well waters about 150 head of range stock. One well is in process of being bored at present, and it is purposed to put down two additional wells during this coming winter at remote points in the range for the use of the range herd.

PRODUCTS OF THE STATION.

Dairy.—During the year the dairy herd produced 37,905¾ gallons of milk, an increase of 2,500 gallons over the preceding year. Butter, in amount 525 pounds, and veal, in amount 854 pounds, were also furnished. In August, 1909, the dairy herd numbered 160 head; in October, 1909, the herd numbered 146, but the milk output of the herd had increased owing to the elimination of cows kept at a loss and the addition of station-raised cattle tested as to their production. Two thoroughbred Jersey bulls were purchased for this herd during the year. At the request of settlers living in the vicinity of the station, authority was obtained from the department for the sale at auction of calves from the dairy herd not needed as additions to the herd. The Fort Stanton herd has quite a reputation in this part of the country, and stock from this herd has long been desired by our neighbors. Three public sales were held at intervals throughout the year, and 43 calves, ranging from a few days to a few months old, were sold for an aggregate sum of $177.40.

Beef herd.—During the year the station was supplied with beef from the range herd for a period of 10 months, and hides were sold to the value of $574.50 net. The total amount of beef produced was 77,275 pounds. At the annual round-up in October, 1910, the beef herd numbered 1,572 head of all sorts. During the fiscal year there were killed for beef from this herd 160 head, and the loss from disease was 22 head, and additions to the herd by purchase amounted to 6 head, being grade Hereford bulls bought for breeding purposes. Total number in range herd at date of this report, 1,396, not counting several hundred calves dropped this summer and not yet branded. During the past winter 9 miles of fence were built, inclosing the southeast corner of the reservation and adding about 4,000 acres to the range. It is recommended that this work be continued until all the reservation is included within our fence, as additional pasture will be needed as the herd increases in number. The year under review was a good year, our loss from disease being under 2 per cent, as compared with about 5 per cent the previous year.

Horses.—During the year it was necessary to kill one of the stallions belonging to the station on account of a broken leg. The other was castrated, as he had become dangerous on account of increasing ill temper. It is recommended, therefore, that the station be supplied with one stallion for breeding purposes. The herd of horses, including all ages, numbers at date of this report 66 head. During the year 4 have died and 4 have been broken in to replace them.

Hogs and poultry.—During the year the station was supplied with 13,972 pounds of fresh pork. From the chicken yard 338½ dozen eggs were furnished. About 200 chicks have been hatched to date this spring, and it is planned to continue additions to the flock of hens until it numbers about 800.

Farm and garden.—The produce of farm and garden during the year was the lowest on record at this station, owing to the fact that 1910 was a very dry year. But little water was available for irrigation of the garden and still less for irrigation of the alfalfa field.

The garden furnished fresh vegetables as follows:

	Pounds.
Beans	171
Beets	4,873
Cabbage	8,286
Cauliflower	1,533
Celery	432
Cucumbers	2,567
Gooseberries	184
Lettuce	601½
Mustard greens	96
Onions	10,323
Peas	666
Radishes	974
Spinach	381
Squash	7,865
Turnips	7,522
Turnip greens	1,249

The orchard produced 2,492 pounds of apples.

The total yield of alfalfa harvested as hay during the season of 1910 amounted to 38 tons, as compared with 232.74 tons the previous year. About 60 tons of alfalfa ensilage was made from the third cutting, but considerably more than half of the total acreage of alfalfa produced no crop at all. Enough corn fodder was raised to complete filling of silos, and the estimated quantity of corn ensilage amounted to about 100 tons. Ensilage was fed the dairy herd fro October 13, 1910, to the close of the fiscal year.

PERSONNEL.

COMMISSIONED AND OTHER OFFICERS.

The commissioned medical officers at the beginning of the fiscal year, July 1, 1910, numbered 128, as follows: The Surgeon General, 6 assistant surgeons general, 34 surgeons, 66 passed assistant surgeons, and 21 assistant surgeons. At the close of the fiscal year, June 30, 1911, the total number was 135, consisting of the Surgeon General, 6 assistant surgeons general, 36 surgeons, 67 passed assistant surgeons, and 25 assistant surgeons.

The changes during the year were as follows: Three passed assistant surgeons were promoted to the grade of surgeon, 3 assistant surgeons were promoted to the grade of passed assistant surgeon, and 7 candidates, who passed the examination required by the regulations, were commissioned as assistant surgeons. On account of physical disability, 1 surgeon was placed on " waiting orders," and 2 surgeons and 1 passed assistant surgeon continued on " waiting orders."

Assignments.—Among other assignments of commissioned medical officers during the fiscal year were the following: Twenty-six were assigned to exclusive immigration duty, their services being supplemented by employment of acting assistant surgeons; 8 to the quarantine service of the Philippine Islands; 8 to vessels of the Revenue-Cutter Service; 22 to the quarantine stations in the continental United States, Porto Rico, and the Hawaiian Islands; 8 to duty in foreign countries to prevent the introduction of epidemic diseases into the United States.

Special details.—Two commissioned medical officers continued on detail duty with the Isthmian Canal Commission. Passed Asst. Surg. V. G. Heiser, in addition to his duties as chief quarantine officer, has been continued as director of health of the Philippine Islands, and Passed Asst. Surg. Carroll Fox has been appointed as assistant director of health. Surg. B. W. Brown has been assigned for duty at Hongkong, China, under the act of Congress approved February 15, 1893, vice Passed Asst. Surg. A. D. Foster, relieved, and Passed Asst. Surg. W. W. King for duty at Naples, Italy, vice Passed Asst. Surg. M. H. Foster, relieved. Upon the request of the Secretary of the Interior, and the approval of the Secretary of the Treasury, Passed Asst. Surg. M. H. Foster was detailed to the Bureau of Education for an investigation of the prevalence of disease among the natives of southeastern and southern Alaska.

Personnel, Hygienic Laboratory.—At the close of the fiscal year, there were on duty in the Hygienic Laboratory, in addition to the director, assistant director, and 3 chiefs of divisions, 9 passed assistant surgeons, 2 assistant surgeons, 2 pharmacists, 1 artist, 8 technical assistants, and 28 attendants.

Quarantine inspector.—One quarantine inspector served throughout the entire year.

Acting assistant surgeons.—At the beginning of the fiscal year there were 274 acting assistant surgeons on duty; 239 were appointed, 2 died, 228 were separated from the service by limitation of appointment, resignations, and removals, leaving on duty at the close of the fiscal year 283 such officers.

Medical inspectors.—Two female inspectors served during the entire year for the inspection of women passengers—1 at Honolulu. Hawaii, and 1 at San Francisco quarantine station.

Internes.—At the beginning of the fiscal year there were 15 internes on duty at the various marine-hospital stations; 17 were appointed, and 20 were separated from the service by reason of resignation, leaving 12 on duty at the close of the fiscal year.

Pharmacists.—At the beginning of the fiscal year there were on duty 46 pharmacists, divided as follows: Pharmacists of the first class, 16; second class, 22; third class, 8. One pharmacist of the first class died, and 2 of the third class resigned; 3 pharmacists of the third class were appointed, 1 pharmacist of the third class was reinstated, and 1 pharmacist of the second class and 1 pharmacist of the third class were promoted, leaving at the close of the fiscal year 47 pharmacists on duty, as follows: Pharmacists of the first class, 16; second class, 23; third class, 8.

Pilots and marine engineers.—At the beginning of the fiscal year there were on duty 17 pilots and 20 engineers; 2 pilots resigned, 1 died, and 1 was appointed; 4 marine engineers resigned, and 4 were appointed. The number on duty at the close of the fiscal year was as follows: Pilots, 15; marine engineers, 20.

Hospital and Quarantine Attendants.

At the beginning of the fiscal year 900 attendants were employed at the various marine hospitals, quarantine stations, and on epidemic duty, including 71 such employees on duty in the Philippine Islands, and at the close of the fiscal year there were so employed as follows:

Branch of service in which employed.	In service July 1, 1910.	Appointed during year.	Separated from service.	In service June 30, 1911.
Marine-Hospital Service	449	591	546	494
Quarantine (including Porto Rico and Hawaii)	331	239	254	315
Epidemic	120	195	115	200
Total	900	1,024	915	1,009
Philippine Islands	71	31	30	72

RECAPITULATION.

Commissioned medical officers	135
Chiefs of divisions, Hygienic Laboratory	3
Artist	1
Technical assistants	8
Quarantine inspector	1
Acting assistant surgeons	283
Medical inspectors	2
Internes	12
Pharmacists	47
Pilots	15
Marine engineers	20
Attendants	1, 009
Laborers	8
Total	1, 544

BOARDS CONVENED.

Twenty-seven boards were convened at different times and at various stations throughout the United States for the physical examination of officers of the Revenue-Cutter Service and applicants for entrance therein. Seven boards were convened for the examination of passed assistant and assistant surgeons to determine their fitness for promotion to the next higher grades of the service.

Eight for the physical examination of detained aliens; two for the examination of pharmacists, to determine their fitness for promotion to a higher grade; one for examination of applicants for entrance as assistant surgeons; and one board to prepare a new "Nomenclature of diseases."

The bureau sanitary board has been convened in five sessions to pass upon reports of inspections of establishments engaged in the manufacture of vaccines, serums, toxins, etc., prior to recommending a license; and to pass upon advertised remedies and appliances to determine if said advertisements should be excluded from the mails.

PUBLICATIONS.

Three hundred and thirty-five thousand five hundred and forty-four copies of the various service publications have been distributed during the year ended June 30, 1911. These include annual reports of the Surgeon General, weekly Public Health Reports, reprints from Public Health Reports, Public Health Bulletins, Hygienic Laboratory bulletins, bulletins of the Yellow Fever Institute, and certain miscellaneous publications.

In addition to the publications sent out on the regular mailing lists a large number were mailed in response to numerous written and verbal requests received daily. Over 9,000 written requests were received during this fiscal year, as compared with about 3,000 such requests received during the fiscal year 1909, asking for one or more publications, showing a manifest increase in the demand for literature along public health lines and matters of sanitation. It has been impossible to comply with many of these requests on account of the fact that the editions are small and in many instances already exhausted.

Literature on pellagra and hookworm disease should be placed in the hands of practically every physician in the Southern States, as there is but comparatively little English literature on pellagra particularly, and the furnishing of this information is a manifest duty of the Federal Government. The increased demand for the various publications of the bureau will necessitate much larger original editions, and in some cases second and even third reprints will be necessary in order that American physicians and the general public may become better informed regarding disease and public health matters.

The question of larger editions of the publications of this bureau was brought before Congress by the Secretary of the Treasury in a letter of April 25, 1910, transmitting a letter from the Surgeon General of April 14, 1910, in which it was recommended that a fixed appropriation be made in the sundry civil appropriation bill for the printing for this bureau, but no favorable action was taken by Congress.

It is estimated that only about one-third of the bulletins and reprints asked for during the past year have been available, and for this reason and on account of the widespread agitation for further activities on the part of the department in matters affecting the public health, it is hoped that ample provision will be made for a wider distribution of the bulletins and other reports of this bureau.

SPECIAL ARTICLES.

Outside of many articles of a scientific and public health nature prepared by the service officers and published in the various medical and scientific journals, 54 special articles have been prepared and published in the weekly Public Health Reports.

The following is a list of these special articles with the exception of those which have appeared as reprints from Public Health Reports:

Beriberi in the United States. Editorial. July 1, 1910.

Sanitary Conditions in Bluefields, Nicaragua. Jumel. July 1, 1910.

The Practical Workings of the "Surface Privy," and the "Lime System." Stiles and Gardner. July 8, 1910.

Rat Suppression in San Francisco, Cal. Converse. July 22, 1910.

Notes on Agents Used for Flea Destruction. Mitzmain. July 29, 1910.

Antirabic Treatments at the Hygienic Laboratory, August 12, 1910.

Smallpox and Vaccination in Uruguay. Compulsory Vaccination Bill. Consul Goding. August 12, 1910.

Further Observations on the Disposal of Excreta. (Second paper), Stiles and Gardner. August 19, 1910.

Measures against Cholera in Russia. August 19, 1910.

On the Cultivation of the Bacillers of Leprosy by the Method of Clegg. Currie, Brinckerhoff, and Hollmann. August 26, 1910.

Establishments Licensed for the Propagation and Sale of Viruses, Serums, Toxins, and Analogous Products. August 26, 1910.

Smallpox in Japan. Irwin. September 2, 1910.

Special Rules Adopted by the Iowa State Board of Health Regarding Infantile Paralysis. September 2, 1910.

The Cholera Outbreak in Italy. Geddings. September 16, 1910.

Poliomyelitis in the United States, Editorial. September 30, 1910.

Report of the Proceedings of the Tenth International Congress of Pharmacy, Brussels, September 1–6, 1910. Hunt. October 7, 1910.

Status of Cholera in Italy. Geddings. October 7, 1910.

Conferences on Epidemic Poliomyelitis at the Meeting of the American Public Health Association, Milwaukee, Wis., September 5–9, 1910. Frost. October 14, 1910.

Measures to Prevent the Introduction of Cholera into the United States. Editorial. October 21, 1910.

Precautions Against Importation of Cholera. Issued by Uruguayan National Hygienic Council. October 21, 1910.

Poliomyelitis in the United States. Editorial. October 28, 1910.

Prevention of Cholera. Immigrant Destination Card. Editorial, October 28, 1910.

Measures to Prevent Introduction of Cholera into the United States. Editoral, November 4, 1910.

Second International Conference for the Study of Cancer (Paris, Oct. 1–5, 1910) and Ninth International Antituberculosis Conference (Brussels, Oct. 5–8, 1910). Hunt. November 11, 1910.

Measures to Prevent the Introduction of Cholera into the United States. Editorial. November 11, 1910, and November 18, 1910.

Sanitary Passports at France. Consul Beecher. November 25, 1910.

Pellagra in Florida. Porter. December 9, 1910.

Further Observations on the Disposal of Excreta. (Third paper.) Stiles and Gardner. December 16, 1910.

Quarantine and Disinfection System at Colombo, Ceylon. Consul Magelssen. December 23, 1910.

Leper Segregation Ordinances. Hongkong, China. Hough. December 23, 1910.

Pellagra and its Possible Relation to Maize According to Some Recent Views. A Review. Lavinder. February 24, 1911.

The Section on Health of the Southern Commercial Congress. March 3, 1911.

Poliomyelitis in the United States. Table. Cases and deaths reported during the year 1910. March 31, 1911.

Sanitary Regulations for the Prevention of the Spread of Plague at Mukden, China. Consul Fisher. March 3, 1911.

Beriberi in South Carolina. Sams. March 10, 1911.

Epidemic Pneumonic Plague in North China. Consul General Knabershue. March 10, 1911.

Municipal Ordinances, Rules, and Regulations pertaining to Public Hygiene Abstracted or in full. Beginning March 24, 1911, and continuing.

Status of Plague in Harbin, China. Measures adopted against Plague. Consul Greene. March 24, 1911.

Resolutions of the Irkutsk Plague Conference. Consul Greene, Harbin, China. April 14, 1911.

Campaign Against Plague-Infected Squirrels in California. Editorial. April 21, 1911.

Plague in Manchuria and Its Relation to the United States. Precautions taken in Manchuria and by the United States Government. Editorial. April 21, 1911.

Assignment of Inspectors to Fruit Ports of Central America and West Indies. Circular of instruction. Editorial. April 21, 1911.

Sanitary Conditions in Alaska. Editorial. Report of Asst. Surg. H. E. Hasseltine. May 5, 1911.

A Note Regarding the Photodynamic Action of Corn with Reference to Pellagra. Lavinder. May 5, 1911.

Antityphoid Vaccination for Beneficiaries of the Public Health and Marine-Hospital Service. Editorial. May 19, 1911.

Case of Leprosy in North Dakota. June 9, 1911.

Experimental Measles in the Monkey. A preliminary note. Anderson and Goldberger. June 9, 1911.

Recent Reports of Cholera. Editorial. June 16, 1911.

Leprosy and Pellagra in Rhode Island. Dr. Gardner T. Swartz. June 23, 1911.

An Attempt to Infect the Rhesus Monkey with Blood and Spinal Fluid from Pellagrins. Anderson and Goldberger. June 30, 1911.

A Note on the Inoculation of the Rhesus Monkey with Blood, Spinal Fluid, and Nervous Tissue from Pellagrins. Lavinder. June 30, 1911.

Cerebrospinal Meningitis in Greece. Feltos. June 30, 1911.

Reports of Leprosy in Florida and Kansas. June 30, 1911.

Cholera and Cholera Carrier at New York Quarantine. Measures against importation of cholera. June 30, 1911.

REPRINTS FROM PUBLIC HEALTH REPORTS.

The weekly Public Health Reports are published in editions of 4,000 and distributed mainly to health officers and other sanitary authorities in accordance with the act of Congress approved February 15, 1893.

There has been an increasing demand for reprints of the special articles which appear from time to time in the Public Health Reports, and to meet this demand many of these articles have been printed as "Reprints."

The following is a list of the reprints published during the year and the editions of each:

48.	What the Mayor and City Council Can Do in the Prevention of Typhoid Fever. Lumsden	3,000
49.	The Present Organization and Work for the Protection of Health in the United States. Wyman	4,000
50.	The History, Development, and Statistics of Milk Charities in the United States. Kerr	1,000
51.	Pulmonary Hemorrhage in the Tuberculous at High Altitude (6,200); Report of 56 Deaths; Frequency of Associated Heart Disease. Smith	1,000
52.	Bacteriological Procedure in Suspected Cholera, with Report of a Positive Case. Anderson and Stimson	1,000
53.	Cholera: Its Nature, Detection, and Prevention. A. J. McLaughlin (2 editions)	8,000
54.	Preliminary Note on a Simple and Inexpensive Apparatus for Use in Safe Disposal of Night Soil. Lumsden, Roberts, and Stiles	3,000
55.	The Field Investigation of Epidemic Poliomyelitis (What the Health Officer Can Do Toward Solving a National Problem). Frost	4,000
56.	Report on an Outbreak of Typhoid Fever at Des Moines, Iowa. Lumsden	2,000
57.	Smallpox and Vaccination in the Philippine Islands. Heiser and Oleson	2,000

58.	The Typhoid Bacillus Carrier: A Review. Grimm	1,500
59.	Report on an Original Farm of Sulphur Burner for Disinfection. Roberts and McDermott	1,500
60.	A Note on Smallpox and Vaccination in the Philippine Islands. Heiser. Smallpox and Vaccination in Cuba. Villoldo	2,000
61.	Smallpox in the United States. Prevalence and Geographic Distribution During the Calendar Year 1909. Trask	1,500

Public Health Bulletins.

Public Health Bulletin No. 37, "The Sanitary Privy," has become exhausted and a second edition of 5,000 has been received since the close of this fiscal year. This bulletin should be placed in the hands of every householder in districts not provided with good sewerage systems, and especially in rural districts. In order that the invaluable information set forth in this bulletin might be placed in the hands of those living on the farms and in outlying districts, a revised manuscript thereof has been submitted to the Secretary of Agriculture and printed as Farmers' Bulletin No. 463, in an edition of 100,000.

Four bulletins of this series were published during this fiscal year and one since July 1, 1911, as follows:

No. 41. Studies upon Leprosy—XII. Notes on the Study of Histories of Lepers from the Standpoint of Transmission. By D. H. Currie—XIII. A Contribution to the Study of Rat Leprosy. By D. H. Currie and H. T. Hollmann.—The two papers contained in this bulletin are the twelfth and thirteenth of a series relating to studies upon leprosy.

The twelfth paper contains the results of studies of the histories of a number of lepers, made to throw light, if possible, on the methods of transmission. From the data gained the author mentions certain points as worthy of notice, viz, a large percentage of the cases gave histories of exposure to leprosy some time before they themselves developed the disease; there appeared to be no evidence of connection of itch in some patients with their subsequent development of leprosy; there was nothing in the histories to indicate any relationship between vaccination and the spread of leprosy.

In the thirteenth paper the interesting fact is brought out that artificially acquired rat leprosy sometimes begins as a broncho-pneumonia, and that during the stages in which the animals were very ill certain mites (*Laelaps echidninus*) were found to be very numerous on their bodies. This suggests a further study of the relationship of these mites to the transmission of the disease.

No. 42. Disinfectants—Their Use and Application in the Prevention of Communicable Diseases. By T. B. McClintic.—This bulletin discusses the all-important relationship of disinfectants to the prevention of communicable diseases. Disinfectants are classified, and the uses and limitations of the most important ones are described. The various insecticides are also taken up in the same way. A special chapter is then devoted to the indications for the use of disinfectants and insecticides in the presence of the more important communicable diseases, such as typhoid fever, smallpox, scarlet fever, diphtheria, tuberculosis, leprosy, plague, typhus fever, and yellow fever. The method of handling these diseases to prevent spread of the infections is also briefly discussed, and the entire bulletin is couched in plain, simple language available for the use of the householder in case of need.

No. 43. I. Studies upon Plague in Ground Squirrels (in four parts)—II. A Plaguelike Disease of Rodents. By George W. McCoy.—The first paper takes up the pathology and bacteriology of plague in ground squirrels, and the lesions of the various types of plague in these animals are described. Special attention is called to the predominance of the subacute type and to the great variation in the lesions in different cases. There is mentioned the possibility of a probable diagnosis in acute cases by means of microscopic examinations, and the impossibility of doing so in subacute and chronic cases, and the decreased virulence of the organisms in squirrel plague is pointed out.

The results of experiments were given which indicated that healthy squirrels from localities where the epizootic has prevailed for several years are decidedly more resistant to artificial infection with *B. pestis* than those from localities in which plague has not appeared among the squirrels. Finally the results of insect transmission experiments are given, and it is shown beyond question that plague may be conveyed from one ground squirrel to another or from a ground squirrel to white rats by means of squirrel fleas (*C. acutus*) and from a white rat to a ground squirrel by means of rat fleas.

The second part of the bulletin contains a description of a plaguelike disease of rodents discovered by McCoy. It is shown that the disease is readily transmitted to guinea pigs, mice, rabbits, monkeys, and gophers, and that the disease may be transmitted artificially by subcutaneous, cutaneous, nasal, and intraperitoneal inoculation. While the causative agent is present in the circulating blood, it is stated that it has not been isolated, nor is the mode of transmission in nature known.

No. 44. Acute Anterior Poliomyelitis.—This bulletin presents in concise form the present status of our knowledge of anterior poliomyelitis. A history of the disease is given, the etiology discussed, the pathology is described, the symptoms outlined, and recent epidemiological studies referred to. In view of the probable recurrence of the disease the bulletin is a timely one.

No. 45. A Digest of the Laws and Regulations of the Various States relating to the Reporting of Cases of Sickness.—This is the first of a series of bulletins which it is expected will be published relating to existing public-health laws in the several States and Territories. The part played by reports of sickness in public-health work is discussed, and this is followed by an analysis of the laws, as well as copies of the laws themselves.

BULLETINS OF THE HYGIENIC LABORATORY.

The wide scope of the investigations made in the four divisions of the Hygienic Laboratory is fairly well shown by the bulletins published during the last fiscal year or which are now in press. These bulletins are as follows:

No. 70. A study of melting-point determinations, with special reference to the melting-point requirements of the United States Pharmacopœia. By George A. Menge.

This bulletin reports the results of a comprehensive study of melting-point determinations, with special reference to the application of this important test in the standardization of many drugs which are officially described by the United States Pharmacopœia.

The work was undertaken in this laboratory by special request, through the proper channels, of the committee of revision of the United States Pharmacopœia, the specific purpose being to select or devise a simple and efficient method for melting-point determinations which could be recommended for adoption as the official method of the pharmacopœia, and by application of this method to standardize the melting points of pharmacopœial compounds. The work resulted in many recommendations to the committee of revision for the improvement of the present United States Pharmacopœia melting-point requirements, and in the tentative standardization of a group of pharmocopœial compounds.

No. 71. 1. Some known and three new endoparasitic trematodes from American fresh-water fish; by Joseph Goldberger. *2. On some new parasitic trematode worms of the genus telorchis;* by Joseph Goldberger. *3. A new species of athesmia (A. Foxi) from a monkey,* by Joseph Goldberger and Charles G. Crane.

There are three papers in this bulletin. The first concerns itself with flukes from American fresh-water fish, principally bass. Some species previously described are here more fully discussed, and three new species described.

The second deals with a group of parasitic trematodes from reptiles that are allied to certain parasites of man. Two new species are described.

The third paper discusses a remarkable form of fluke from a monkey, the second species of the genus to which it belongs. It is very closely allied to a form parasitic in man, i. e., *Dicrocoelium lanceatum.*

These parasites are of interest, not only because some of them are harbored by important food fishes but also because of their relation to certain parasites of man. A study of the former, therefore, is bound to throw light on the latter. This indirect method of approach is the only one open to us, as experiments on man are out of the question.

No. 72. I. Report on an outbreak of typhoid fever at Omaha, Nebr., 1909–1910; by L. L. Lumsden. *II. The water supply of Williamson, W. Va., and its relation to an epidemic of typhoid fever;* by W. H. Frost.

This contains two papers which are the result of investigations of typhoid fever by officers of this service. The first report shows that the outbreak of typhoid fever in Omaha was extensive and that synchronously with its occurrence in Omaha the disease prevailed at an unusually high rate in other cities and towns along the Mississippi-Missouri River watercourse. The investigation pointed unmistakably to the water obtained from the Missouri River as having been the source of the infection.

In the second paper Passed Asst. Surg. Frost shows that the epidemic at Williamson, W. Va., was due to an infection of the municipal water supply obtained from the Tug River. Contact infection was also responsible for a large proportion of secondary cases occurring in November, 1909. As a result of his investigation Dr. Frost made certain recommendations with a view to preventing a recurrence of the epidemic.

No. 73. The effects of a number of derivatives of choline and analogous compounds on the blood pressure. By Reid Hunt and R. de M. Taveau.

In this bulletin is given the result of a study of a large number of new compounds, some of which have more pronounced effects upon the circulation than any drugs at present known. Possibly some of them may prove of therapeutic value. Choline is of interest from the fact that it occurs in a number of drugs such as ergot, and in studying these bacteriologically it is necessary to consider the choline present. This substance and its compounds occur in many articles of food, and as they are easily converted by the action of bacteria into certain various poisonous substances, it is of importance to know about them.

No. 74. Digitalis standardization and the variability of crude and of medicinal preparations. By Worth Hale.

At the present time there is no chemical method available for the purpose of securing digitalis preparations that are neither too weak nor too strong. Of the methods of assay, using the lower animals as test objects, none has been shown to be more than relatively accurate. This bulletin reports the testing of one of these methods, showing that it gives results with an error of less than 5 per cent. It further treats of the cause of variability in the crude drug, including tests of American-grown leaves, which are shown to be equal to imported leaves in activity. Also, the results of the examination of various pharmacopœial and nonofficial preparations are given, these having been found to vary as much as 400 per cent in strength.

No. 75. Digest of comments on the Pharmacopœia of the United States of America (eighth decennial revision) and the National Formulary (third edition) for the calendar year ending December 31, 1908. By Murray Galt Motter and Martin I. Wilbert.

This is the fourth of a series in which the suggestions and criticisms concerning the pharmacopœia are collected, abstracted, and classified, thus making this information available for use, not only of the officers of this service but for all officials engaged in the enforcement of Federal and State pure drug laws, and all those occupied in the revision of the Pharmacopœia. The board of trustees, in the report to the decennial convention for the revision of the Pharmacopœia, stated:

> The completeness and great value of these digests as aids to more perfect pharmacopœia revision are so well known that further comment would be altogether superfluous.

And the United States pharmacopœial convention passed a unanimous vote of thanks to the Public Health andMarine-Hospital Service "for these contributions to the conservation of the public health and to the progress of American medicine and pharmacy."

No. 76. The physiological standardization of ergot. By Charles Wallis Edmunds and Worth Hale.

The results of the combined studies of Prof. Edmunds, who had a temporary appointment in the laboratory during the past summer, and of Dr. Hale, technical assistant, are included in this bulletin. The work is on a subject which, to the present time, has been a much-mooted one and one which required some authoritative work, as it is believed this work is.

Ergot is one of the most important drugs used in medicine on account of its value in promoting the contractions of the uterus at childbirth and subsequently to prevent hemorrhage. It has long been a matter of clinical knowledge, however, that many preparations of ergot on the market were without activity. In order to insure a preparation of uniform potency, assays of both a chemical and physiological character have been suggested, and this bulletin gives the results of an experimental review of the whole subject.

No. 77. Sewage pollution of interstate and international waters with special reference to the spread of typhoid fever. By Allan J. McLaughlin.

This is another study upon the epidemiology of typhoid fever by an officer attached to the laboratory. The prevalence of typhoid fever in the United States has been characterized by some writers as a national disgrace, as it has been shown that the eradication of typhoid fever involves two distinct stages: First, a getting rid of the water-borne typhoid, and, second, attacking that which remains, variously named " residual," " contact," or " endemic " typhoid fever.

The bulletin takes up particularly the relation of certain international and interstate waters and the prevalence of typhoid fever in certain sections. This paper is the first of a series of papers which it is contemplated to present for publication on the problem as it affects certain international and interstate waters. The investigation was begun on the Great Lakes because of the industrial and commercial importance of the lake cities and the opportunities for the spread of typhoid fever by means of the enormous interstate traffic for which these cities are responsible.

No. 78. Report No. 4 on the origin and prevalence of typhoid fever in the District of Columbia (1909). By L. L. Lumsden and John F. Anderson.

In this are given the results of the four years' study on the origin and prevalence of typhoid fever in the District of Columbia and it represents the final report of the board which has been studying typhoid fever in the District during this time. The results are summarized and from these results definite and specific recommendations are made which it is believed, if carried out, will have a marked influence upon the decrease of typhoid fever in the District of Columbia.

LIBRARY.

Forty-one medical and scientific journals were subscribed for during the fiscal year. In addition to these, about 20 others are received regularly, either gratuitously or as exchanges. In most instances these are bound and become a part of the bureau library. Many new books, especially ones dealing with sanitation and public health, sewage treatment, water purification, etc., have been purchased for the library, which now numbers about 4,000 volumes.

There is an urgent need for new covered bookcases in order to properly protect these books, many of which can not be replaced. As complete a set as possible of bound reports of city and State boards of health has been procured and added to the library.

NEEDS OF THE SERVICE.

In view of active plague-suppressive measures on the Pacific coast, and the extensive campaign to prevent the threatened invasion of cholera now prevalent in Europe, special attention is invited to the necessity of enlarging the epidemic fund in accordance with the estimates submitted by the bureau.

There is also need of increase in the number of service publications upon public-health topics and of much larger editions to supply the rapidly growing demands from all parts of the country.

Within the past ten years the duties imposed upon the service and the bureau have been greatly enlarged. During that period only one addition has been made to the clerical force in the bureau, and an increase is urgently needed, as set forth in the estimates submitted to the department.

Pellagra, a distressing and fatal disease but recently discovered in this country and now recognized as widely prevalent, particularly in the Southern States, has been made the subject of extensive investigation by officers of the service assigned especially to that work. The disease is spreading, and in spite of the efforts made by health authorities in this country and abroad, its cause remains undetermined. There is danger of it becoming permanent in the United States, as it has been for many years in Italy, where is has caused great suffering, loss of life, and expense. A special appropriation for the investigation of this disease has been requested by the bureau, and it is regarded as a matter of great importance.

A new building for the Hygienic Laboratory at Washington is required to replace temporary structures and provide space for special researches, disinfection experiments, housing of small laboratory animals, and for other purposes. The estimated cost is $25,000.

Attention is invited to the bill, S. 2117, " To promote the efficiency of the Public Health and Marine-Hospital Service," which passed the Senate June 20, 1911, and has been referred to the Committee on Interstate and Foreign Commerce of the House of Representatives. A similar bill, H. R. 11171, is also before the same committee. These bills provide adequate compensation for the commissioned medical officers of the service. It is urged that the measure be enacted into law.

Respectfully submitted.

WALTER WYMAN,
Surgeon General.

Hon. FRANKLIN MACVEAGH,
Secretary of the Treasury.

APPENDIX.

FINANCIAL STATEMENT.

RECEIPTS AND EXPENDITURES, PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE, FOR THE FISCAL YEAR ENDED JUNE 30, 1911.

PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE, 1911.

	Appropriations and repayments.	Expenditures.	Balances, June 30, 1911.	Less estimated outstandings.
Pay and commutation, commissioned officers and pharmacists	$316,000.00	$308,021.67	$7,978.33	$170.26
Pay, other employees	375,000.00	364,755.75	10,244.25	266.82
Freight and travel expenses	30,450.00	22,475.31	7,974.69	5,154.63
Fuel, light, and water	72,000.00	65,953.20	6,046.80	1,041.61
Furniture and repairs	8,000.00	4,770.33	3,229.67	3,178.92
Purveying depot:				
Purchases	45,000.00			
Repayments	2,051.84	47,035.98	15.86	
Rent	3,250.00	3.250.00		
Maintaining Hygienic Laboratory	14,900.00	13,999.02	900.98	702.70
Marine hospitals:				
Maintenance	250,000.00			
Repayments	16,087.15	250,648.37	15,438.78	9,423.29
Care of seamen and other purposes	145,000.00			
Repayments	2,177.29	126,210.26	20,967.03	283.68
Bureau books	500.00	421.40	78.60	75.63
Total	[1] 1,280,416.28	1,207,541.29	72,874.99	20,297.54

[1] Appropriations, $1,260,100; repayments, $20,316.28.

For exdenditures by stations, see Statistical Table II.

QUARANTINE SERVICE, 1911.

Amount of appropriation	$400,000.00
Repayments, subsistence furnished, etc	1,605.61
Total	401,605.61
Expenditures	385,067.73
Balance June 30, 1911	16,537.88
Less outstanding liabilities (estimated)	11,402.49

EXPENDITURES BY STATIONS.

Name of station.	Pay and allowances, officers and employees.	Subsistence and miscellaneous.	Medical and hospital supplies.	Total.
Alexandria, Va	$90.00	$16.10	....	$106.10
Beaufort, S. C	1,500.00	125.96	....	1,625.96
Biscayne Bay, Fla	1,617.00	....	....	1,617.00
Boca Grande, Fla	2,881.67	448.94	$1.34	3,331.95
Brunswick, Ga	3,053.33	1,602.90	10.61	4,666.84
Cape Charles, Va	9,607.72	6,693.53	211.20	16,512.45
Cape Fear, N. C	5,825.10	2,611.89	81.86	8,518.67
Cedar Keys, Fla	317.00	6.51	....	323.51
Charleston, S. C	6,181.66	1,051.45	18.17	7,251.28
Columbia River, Oreg	10,043.00	5,308.10	208.20	15,559.30
Coos Bay, Oreg	200.00	9.90	....	209.90
Cumberland Sound, Fla	3,180.00	72.00	....	3,252.00
Delaware Breakwater, Del	4,814.17	2,297.52	68.61	7,180.30
Eureka, Cal	900.00	1,004.58	2.12	1,906.70
Florence, Oreg	200.00	....	....	200.00
Georgetown, S. C	240.00	114.15	7.32	361.47
Gulf, Miss	9,073.34	5,044.20	40.02	14,157.56
Hawaii	29,058.78	10,284.58	231.46	39,574.82
Key West, Fla	4,399.98	1,056.22	....	5,456.20
Miscellaneous	....	605.65	....	605.65
Mobile, Ala	11,714.43	7,844.29	21.33	19,580.05
Newbern, N. C	200.00	....	....	200.00
New Orleans, La	26,339.49	8,643.16	209.59	35,192.24
Newport, Oreg	200.00	....	....	200.00
Pascagoula, Miss	1,620.00	324.72	....	1,944.72
Pensacola, Fla	8,964.29	3,812.58	62.65	12,839.52
Perth Amboy, N. J	1,623.00	988.07	....	2,611.07
Port Harford, Cal	290.00	1.36	....	291.36
Port Inglis, Fla	300.00	....	....	300.00
Portland, Me	7,058.90	1,454.15	....	8,513.05
Porto Rico	22,761.24	6,401.26	140.06	29,302.56
Port Royal, S. C	1,500.00	100.27	....	1,600.27
Port Townsend, Wash	15,351.99	2,653.07	....	18,005.06
Punta Rassa, Fla	300.00	....	....	300.00
Reedy Island, Del	15,965.93	11,928.87	279.17	28,173.97
St. George Sound, Fla	3,160.00	416.00	....	3,576.00
St. Johns River, Fla	2,050.00	442.36	7.79	2,500.15
San Diego, Cal	6,186.00	2,964.24	34.84	9,185.08
San Francisco, Cal	26,664.51	21,109.94	135.26	47,909.71
San Pedro, Cal	85.00	198.71	....	283.71
Santa Barbara, Cal	95.00	....	....	95.00
Savannah, Ga	10,219.50	5,119.83	33.60	15,372.93
South Atlantic, Ga	3,351.17	1,407.42	....	4,758.59
Tampa Bay, Fla	6,840.00	2,991.74	57.29	9,889.03
Washington, N. C	626.00	....	....	626.00
Total	266,044.20	117,161.22	1,862.31	385,067.73

PREVENTING THE SPREAD OF EPIDEMIC DISEASES.

Balance July 1, 1910		$700,116.24

EXPENDITURES.

Foreign medical service, salaries and miscellaneous, China, Japan, Italy, Central and South America, and West Indies	$59,894.51	
Panama and Canal Zone, salaries, etc	6,887.98	
Habana, Cuba (including outlying districts), salaries, subsistence, supplies, and miscellaneous	17,506.59	
Mexico, salaries, supplies, etc	4,881.62	
Sanitary inspection in United States, salaries, traveling expenses, and miscellaneous	13,042.95	
Plague suppressive measures, Pacific coast	164,860.63	
Yellow fever, maintenance of detention camp, precaution against outbreak, salaries, medical and hospital supplies, disinfectants, etc	12,868.43	
Texas border inspection, salaries and miscellaneous	4,484.42	
		284,427.13
Balance June 30, 1911		415,689.11
Less outstanding liabilities (estimated)		44,525.00

National Quarantine and Sanitation.

Balance July 1, 1910		$113, 648. 86
Expenditures for improvements and miscellaneous:		
Mobile, Ala	$4, 445. 40	
New Orleans, La	30, 404. 05	
Galveston, Tex	219. 60	
Miscellaneous	86. 64	
		35, 155. 69
Balance June 30, 1911		78, 493. 17
Less outstanding liabilities (estimated)		17, 037. 99

Salaries, Office of Surgeon General, Public Health and Marine-Hospital Service, 1911.

Amount of appropriation	$40, 980. 00
Expenditures	39, 515. 98
Balance June 30, 1911	1, 464. 02

Maintenance of Leprosy Hospital, Hawaii, 1911.

Amount of appropriation	$33, 000. 00
Expenditures	25, 080. 41
Balance June 30, 1911	7, 919. 59
Less outstanding liabilities (estimated)	5, 377. 73

Leprosy Hospital, Hawaii, Buildings and Equipment.

Balance July 1, 1910	$19, 319. 35
Expended July 1, 1910, to June 30, 1911	2, 363. 00
Balance June 30, 1911	16, 956. 35

Hygienic Laboratory, Public Health and Marine-Hospital Service.

Amount appropriated (act June 25, 1910)	$15, 000. 00
Balance June 30, 1911	15, 000, 00

Payment to Southern Pacific Co., Damages to Ferry Steamer "Encinal."

Amount appropriated (act June 25, 1910)	$1, 517. 08
Expended July 1, 1910, to June 30, 1911	1, 517. 08

Appropriations, Marine Hospitals.

Cleveland, Ohio:	
Balance July 1, 1910 (act Mar. 4, 1909)	$100. 00
Balance June 30, 1911	100. 00
Balance July 1, 1910 (act Mar. 4, 1907)	374. 95
Balance June 30, 1911	374. 95
Wilmington, N. C.:	
Balance July 1, 1910 (act Mar. 4, 1909)	7. 50
Balance June 30, 1911	7. 50
Chicago, Ill.:	
Balance July 1, 1910 (act Mar. 3, 1905)	444. 98
Balance June 30, 1911	444. 98
Amount appropriated (act June 25, 1910)	6, 000. 00
Balance June 30, 1911	6, 000. 00

Baltimore, Md.:

Balance July 1, 1910 (act Mar. 4, 1907)	1.49
Amount carried to surplus fund	1.49

Boston, Mass.:

Balance July 1, 1910 (act Mar. 4, 1907)	185.93
Balance June 30, 1911	185.93

Key West, Fla.:

Balance July 1, 1910 (act Mar. 4, 1907)	50.65
Balance June 30, 1911	50.65

New Orleans, La.:

Balance July 1, 1910 (act Mar. 4, 1907)	24.30
Balance June 30, 1911	24.30

Detroit, Mich.:

Amount appropriated (act June 25, 1910)	1,000.00
Expended July 1, 1910, to June 30, 1911	941.00
Balance June 30, 1911	59.00

Mobile, Ala.:

Amount appropriated (act June 25, 1910)	500.00
Expended July 1, 1910, to June 30, 1911	468.00
Balance June 30, 1911	32.00

APPROPRIATIONS, QUARANTINE STATIONS.

Reedy Island:

Balance July 1, 1910 (act Mar. 4, 1909)		$2,971.01
Expended July 1, 1910, to June 30, 1911	$1,011.13	
Outstanding liabilities	1,893.17	
		2,904.30
Balance June 30, 1911		66.71

Charleston:

Balance July 1, 1910 (act Mar. 4, 1909)	20,315.00
Expended July 1, 1910, to June 30, 1911	288.41
Balance June 30, 1911	20,026.59

Savannah:

Balance July 1, 1910 (act Mar. 4, 1909)		3,500.00
Expended July 1, 1910, to June 30, 1911	$10.05	
Outstanding liabilities	1,979.00	
		1,989.05
Balance June 30, 1911		1,510.95

Balance July 1, 1910 (act Mar. 4, 1907)	1.40
Amount carried to surplus fund	1.40

San Francisco:		
Balance July 1, 1910 (act Mar. 4, 1909)		5.00
Balance June 30, 1911		5.00
Balance July 1, 1910 (act Mar. 3, 1905)		385.95
Expended July 1, 1910, to June 30, 1911	$384.90	
Amount carried to surplus fund	1.05	
		385.95
Balance July 1, 1910 (act June 30, 1906)		3,201.35
Balance June 30, 1911		3,201.35
Balance July 1, 1910 (act May 27, 1908)		180.75
Balance June 30, 1911		180.75
Honolulu:		
Balance July 1, 1910 (act Mar. 4, 1909)		9,000.00
Expended July 1, 1910, to June 30, 1911		8,984.00
Balance June 30, 1911		16.00
Balance July 1, 1910 (act Mar. 4, 1907)		390.52
Balance June 30, 1911		390.52
Gulf:		
Balance July 1, 1910 (act Mar. 4, 1907)		778.27
Expended July 1, 1910, to June 30, 1911		424.92
Balance June 30, 1911		353.35
Pensacola:		
Balance July 1, 1910 (act Mar. 4, 1907)		1,078.99
Expended July 1, 1910, to June 30, 1911	$648.97	
Outstanding liabilities	5.50	
		654.47
Balance June 30, 1911		424.52
San Diego:		
Balance July 1, 1910 (act Mar. 4, 1907)		5.00
Amount carried to surplus fund		5.00
Delaware Breakwater:		
Balance July 1, 1910 (act Mar. 4, 1907)		857.00
Balance June 30, 1911		857.00
Brunswick:		
Amount appropriated (act June 25, 1910)		8,664.00
Balance June 30, 1911		8,664.00
Columbia River:		
Amount appropriated (act June 25, 1910)		4,500.00
Expended July 1, 1910, to June 30, 1911	$28.31	
Outstanding liabilities	3,574.00	
		3,602.31
Balance June 30, 1911		897.69

STATISTICAL TABLES.

TABLE I.—COMPARATIVE TABLE OF NUMBER OF PATIENTS ANNUALLY TREATED, 1868 TO 1911.

Fiscal year.	Number of sick and disabled seamen furnished relief.	Fiscal year.	Number of sick and disabled seamen furnished relief.
Prior to reorganization:		**After reorganization—Continued.**	
1868	11,535	1890	50,671
1869	11,356	1891	52,992
1870	10,560	1892	53,610
After reorganization:		1893	53,317
1871	14,256	1894	52,803
1872	13,156	1895	52,643
1873	13,529	1896	53,804
1874	14,356	1897	54,477
1875	15,009	1898	52,709
1876	16,808	1899	55,489
1877	15,175	1900	56,355
1878	18,223	1901	58,381
1879	20,922	1902	56,310
1880	24,860	1903	58,573
1881	32,613	1904	58,556
1882	36,184	1905	57,013
1883	40,195	1906	54,363
1884	44,761	1907	55,129
1885	41,714	1908	54,301
1886	43,822	1909	53,704
1887	45,314	1910	51,443
1888	48,208	1911	52,209
1889	49,518		

TABLE II.—EXHIBIT OF THE OPERATIONS OF THE SERVICE DURING THE FISCAL YEAR ENDED JUNE 30, 1911.

Port.	Total number of seamen treated.	Patients in hospital July 1, 1910.	Admitted during the year.	Total number treated in hospital.	Discharged.	Died.	Remaining in hospital June 30, 1911.	Number of days' relief in hospital.	Number of seamen furnished office relief.	Number of times office relief was furnished.	Number of persons examined physically, including pilots.	Number of foreign seamen treated.	Days' hospital relief furnished foreign seamen.	Amount expended.
Grand total	**52,209**	**1,057**	**14,385**	**15,442**	**13,858**	**463**	**1,121**	**452,723**	**36,767**	**61,851**	**4,610**	**1,003**	**13,282**	**$1,207,541.29**
Albany, N. Y	12	1	11	12	9	2	1	565			12			901.28
Apalachicola, Fla	23	1	7	8	7		1	76	15	25				520.10
Ashland, Wis	78	1	19	20	20			355	59	60				440.95
Ashtabula, Ohio	126	2	25	27	27			351	99	99				523.81
Astoria, Oreg	236	1	48	49	45	2	2	644	187	302	59			1,431.62
Baltimore, Md	2,350	60	567	627	553	22	52	23,624	1,723	3,221	152	3	65	36,014.59
Bangor, Me	64		21	21	20		1	462	43	59	12			1,111.50
Barnstable, Mass., and subports	16								16	61				61.00
Bath, Me	12								12	12	4			250.00
Beaufort, N. C	48		3	3	3			35	45	64	45			495.75
Beaufort, S. C	32								32	32				35.00
Bellingham, Wash	52		20	20	19		1	225	32	75				525.65
Boothbay Harbor, Me	75		14	14	14			289	61	126	6			749.00
Boston, Mass	2,852	77	897	974	857	31	86	34,430	1,878	3,132	254	41	694	47,467.30
Bridgeport, Conn	21	2	19	21	19	2		231	1	1				265.00
Brunswick, Ga	146		30	30	29		1	446	116	130	3	3	35	1,023.85
Buffalo, N. Y	1,756	31	419	450	409	15	26	9,668	1,306	1,769	48	27	297	21,988.29
Burlington, Iowa	13	1	12	13	9	1	3	199						198.00
Cairo, Ill	570	6	197	203	193	2	8	4,016	367	650	3			13,134.92
Cambridge, Md	68		42	42	41	1		682	26	28				955.62
Cedar Keys, Fla	49		2	2	2			5	47	71				22.15
Charleston, S. C	594		90	90	90			852	504	657	45			2,075.15
Chattanooga, Tenn	15		7	7	7			65	8	14				397.50
Chicago, Ill	1,957	40	572	612	553	12	47	21,773	1,345	2,372	82	3	61	40,042.77
Cincinnati, Ohio	197	2	36	38	34	2	2	443	159	272	10			3,431.18
Cleveland, Ohio	1,469	29	437	466	425	15	26	13,344	1,003	2,053	39	2	27	20,573.24
Corpus Christi, Tex	4	1	2	3	3			16	1	4	8			332.30
Crisfield, Md	141								141	190				306.00
Delaware Breakwater, Del	81	1	13	14	14			268	67	71	42	6	118	19.53
Detroit, Mich	1,327	24	295	319	293	6	20	8,565	1,008	3,904	43			24,029.97
Dubuque, Iowa	9		4	4	4			71	5	5	5			386.25
Duluth, Minn	376	6	77	83	75	4	4	1,453	293	369	16			1,853.25
Eastport, Me														45.71
Edenton, N. C	37								37	64				63.00
Edgartown, Mass	4								4	4				7.75
Elizabeth City, N. C	19								19	37	92			370.00

TABLE II.—EXHIBIT OF THE OPERATIONS OF THE SERVICE DURING THE FISCAL YEAR ENDED JUNE 30, 1911—Continued.

Port.	Total number of seamen treated.	Patients in hospital July 1, 1910.	Admitted during the year.	Total number treated in hospital.	Discharged.	Died.	Remaining in hospital June 30, 1911.	Number of days' relief in hospital.	Number of seamen furnished office relief.	Number of times office relief was furnished.	Number of persons examined physically, including pilots.	Number of foreign seamen treated.	Days' hospital relief furnished foreign seamen.	Amount expended.
Ellsworth, Me.	17								17	69	4			$283.00
El Paso, Tex.														64.50
Erie, Pa.	146		47	47	43	2	2	806	99	181	18			1,616.00
Escanaba Mich.	72	1	13	14	13	1		162	58	58	1			482.00
Eureka, Cal.	62	1	13	14	14			118	48	55	13	2	19	680.85
Evansville, Ind.	641	6	180	186	172	4	10	4,267	455	754	14			12,721.01
Fernandina, Fla.	85		6	6	6			93	79	101				439.50
Fort Stanton, N. Mex.	322	154	168	322	101	43	178	65,968						104,022.82
Gallipolis, Ohio	140	2	63	65	62	2	1	1,280	75	216	3			1,964.00
Galveston, Tex.	935	9	260	269	248	3	18	4,511	666	1,046	79			10,031.64
Georgetown, S. C.	219	3	30	33	31	2		254	186	353	8			1,072.87
Gloucester, Mass.	309	1	29	30	27	2	1	381	279	412	50			1,205.20
Government Hospital for the Insane	52	45	7	52	2	5	45	16,166						10,432.43
Grand Haven, Mich.	35	2	17	19	18		1	245	16	23	69			678.85
Green Bay, Wis.	57	1	13	14	13	1		242	43	50	45			590.00
Hartford, Conn.	5	1	4	5	5			120						120.00
Honolulu, Hawaii	974	12	254	266	242	6	18	7,841	708	1,462	69	19	319	15,456.29
Hoquiam, Wash.	99	1	58	59	55	2	2	724	40	42	151	1	4	1,558.51
Houghton, Mich.	2		2	2	2			14			12			259.00
Hygienic Laboratory														100,880.38
Immigration Service														151,659.27
Irvington, Va.	62	1	1	2	1	1		120	60	67				495.00
Jacksonville, Fla.	416	1	134	135	123	7	5	1,628	281	301	11			3,166.64
Juneau, Alaska	131		39	39	38		1	558	92	200	2			2,193.30
Kansas City, Mo.	30	2	5	7	7			210	23	32	19			547.15
Ketchikan, Alaska	148		32	32	31		1	385	116	175	1			2,053.65
Key West, Fla.	444	9	150	159	143	2	14	5,019	265	392	22	10	198	13,846.07
La Crosse, Wis.	57		10	10	10			86	47	69	3			628.64
Little Rock, Ark.	39		17	17	17			131	22	26				378.00
Los Angeles, Cal.	538	9	194	203	190	5	8	3,585	335	640	21	9	211	11,863.44
Louisville, Ky.	924	19	212	231	201	14	16	6,946	693	952	16			15,944.68
Ludington, Mich.	97		21	21	20		1	350	76	138	50			881.10
Machias, Me.	19		8	8	7	1		110	11	11	65			481.00
Manistee, Mich.	73		12	12	10	1	1	146	66	90	31			589.44
Manitowoc, Wis.	152	5	60	65	61	2	2	1,158	87	108	11			1,556.35
Marquette, Mich.	101	3	16	19	18	1		324	82	83	15			705.95
Memphis, Tenn.	1,805	10	513	523	476	28	19	5,975	1,282	1,503	46			17,262.73
Menominee, Mich.	38		11	11	10	1		149	27	44				459.85
Milwaukee, Wis.	1,197	14	331	345	332	3	10	5,663	852	1,084	112			12,823.28

Miscellaneous														1,833.92
Mobile, Ala	1,380	23	471	494	465	6	23	10,260	886	1,203	75	179	1,794	16,745.52
Morgan City, La														75.00
Nashville, Tenn	69		5	5	4	1		67	64	136	9			450.93
Natchez, Miss	93		3	3	3			41	90	211				462.05
New Bedford, Mass	65		5	5	3	1	1	103	60	98	35			428.40
Newbern, N. C	299	1	54	55	52	2	1	552	244	493	18			1,391.75
New Haven, Conn	46	1	21	22	20	2		283	24	29	18			627.90
New London, Conn	62	1	26	27	27			539	35	40	67			1,504.60
New Orleans, La	1,698	36	413	449	384	21	44	15,643	1,249	2,045	77	134	2,058	29,282.24
Newport, Ark	79		5	5	5			28	74	111				459.50
Newport, R. I	35	2	22	24	22	1	1	386	11	14	4			892.65
Newport News, Va	127								127	132	14			401.72
New York, N. Y	3,262	120	1,415	1,535	1,372	33	130	45,631	1,727	2,799	463	426	5,604	53,987.82
Nome, Alaska	25	1	6	7	7			180	18	19				1,874.08
Norfolk, Va	2,754	25	696	721	696	4	21	10,623	2,033	2,433	160	3	37	17,167.79
North Bend, Oreg	68		14	14	14			220	54	80	23			723.25
Ogdensburg, N. Y	61	2	7	9	8		1	167	52	95				504.00
Oswego, N. Y	26		5	5	4		1	53	21	44				159.05
Paducah, Ky	122		17	17	12	2	3	198	105	221				705.13
Pensacola, Fla	99		12	12	10	2		225	87	229	36			885.67
Philadelphia, Pa	2,003	10	463	473	448	10	15	5,150	1,530	2,503	372			13,928.33
Pittsburgh, Pa	503	9	104	113	102	8	3	2,525	390	609	16			14,174.85
Ponce, P. R	44		9	9	9			142	35	87				177.50
Port Arthur, Tex	85		12	12	11	1		124	73	110	64			434.76
Port Huron, Mich	164		9	9	9			186	155	636	24			565.92
Portland, Me	665	12	274	286	257	4	25	8,885	379	525	127	14	124	22,584.63
Portland, Oreg	625	5	180	185	172		13	2,835	440	663	43	9	131	8,811.96
Portsmouth, N. H	15		2	2	2			16	13	27	31			216.00
Port Tampa, Fla	258	2	105	107	99	1	7	2,214	151	267				3,429.71
Port Townsend, Wash	375	34	252	286	244	9	33	12,391	89	158	11	26	533	18,604.76
Providence, R. I	523	5	90	95	86	3	6	1,259	428	889	9	1	16	2,832.90
Provincetown, Mass	89								90	114	58			257.20
Purveying depot														57,170.70
Railroad transportation, freight charges, etc														8,647.91
Revenue-cutter vessels, cruises of	1,544								1,544	3,086				8,233.22
Richmond, Va	46		5	5	4		1	82	41	115				431.25
Rockland, Me	198		1	1	1			88	197	428	29			618.15
Saginaw, Mich	105	3	31	34	32		2	501	71	80	3			808.72
Salem, Mass	9								9	9				9.00
San Diego, Cal	81		19	19	19			289	62	77	9			2,745.86
Sandusky, Ohio	73		6	6	5	1		105	67	100	14			341.25
San Francisco, Cal	2,262	74	1,064	1,138	1,020	51	67	35,272	1,124	1,885	377	41	420	49,531.44
San Juan, P. R	318	9	116	125	121	1	3	2,268	193	244	41			3,178.50
St. Louis, Mo	666	28	240	268	228	10	30	10,215	398	517	56			18,772.14
St. Paul, Minn	15		4	4	3	1		41	11	20				350.30
Sault Ste. Marie, Mich	177	8	86	94	93		1	1,073	83	92	36			1,984.39
Savannah, Ga	1,111	11	334	345	314	6	25	7,874	766	1,109	74	1	11	16,215.35
Seattle, Wash	1,816	8	268	276	264	7	5	3,959	1,540	3,056	205	12	133	6,032.93
Sheboygan, Wis	20		5	5	5			57	15	15	7			396.00
Solomons, Md	326		9	9	9			75	317	382				596.00

TABLE II.—EXHIBIT OF THE OPERATIONS OF THE SERVICE DURING THE FISCAL YEAR ENDED JUNE 30, 1911—Continued.

Port.	Total number of seamen treated.	Patients in hospital July 1, 1910.	Admitted during the year.	Total number treated in hospital.	Discharged.	Died.	Remaining in hospital June 30, 1911.	Number of days' relief in hospital.	Number of seamen furnished office relief.	Number of times office relief was furnished.	Number of persons examined physically, including pilots.	Number of foreign seamen treated.	Days' hospital relief furnished foreign seamen.	Amount expended.
Special duty, etc														$10,645.26
Superior, Wis	251	5	72	77	74	1	2	1,299	174	250				2,034.19
Tacoma, Wash	117		41	41	40		1	718	76	129	6	30	411	1,776.35
Toledo, Ohio	320		125	125	121	3	1	2,010	195	616	2			2,332.46
Traveling expenses														9,429.46
Valdez, Alaska	260	1	9	10	9	1		119	250	427				1,392.50
Vicksburg, Miss	282	2	148	150	144	6		1,323	132	234				2,533.35
Vineyard Haven, Mass	222	6	85	91	79	2	10	2,621	131	133	5			11,340.70
Washington, D. C. (bureau)														36,391.65
Do	102	4	28	32	26	2	4	696	70	112	10			2,051.62
Washington, N. C	148	1	17	18	18			155	130	194	15			186.90
Wheeling, W. Va	9	1	7	8	8			96	1	1				404.00
Wilmington, Del														17.00
Wilmington, N. C	539	4	106	110	102	3	5	1,559	429	529	26			10,739.04
Wiscasset, Me														1.00
Cape Charles quarantine	14		2	2	2			3	12	14				
Cape Fear quarantine	139								139	304				
Gulf quarantine	3		3	3	3			19						
Pensacola quarantine	2		2	2	1	1		4				1	2	
Reedy Island quarantine	13		13	13	13			135						
San Francisco quarantine	10	5	5	10	10			77						
Tampa Bay quarantine	24		21	21	20		1	161	3	3				

TABLE III.—SUMMARY OF PHYSICAL EXAMINATIONS MADE BY OFFICERS OF THE PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE DURING THE FISCAL YEAR ENDED JUNE 30, 1911, EXCLUSIVE OF ALIEN IMMIGRANTS.

Summary of examinations and rejections.	Total.	Pilots.	Merchant seamen.	Revenue-Cutter Service.	Life-Saving Service.	Coast and Geodetic Survey.	Lighthouse Service.	Foreign seamen.	Immigration Service.	Civil Service Commission.	Isthmian Canal Commission.	Philippine Islands.
Total number examined	4,610	1,176	400	1,285	1,932	57	63	18	138	134	30	20
Number passed	4,204	1,124	372	1,085	1,854	46	54	14	124	124	30	19
Number rejected	406	52	28	200	78	11	9	4	14	10	....	1
Causes of rejection (diseases, disability, etc.)												
Abscess of connective tissue	1			1								
Adenoids	2			2								
Albuminuria	7			7								
Alcoholism	1		1									
Ankylosis of elbow	1			1								
Appendicitis, chronic	2				2							
Asthma, spasmodic	1			1								
Bronchitis, acute	8		2	4	1		1					
Cataract, lenticular	2			1	1							
Carcinoma of rectum	1			1								
Conjunctivitis, chronic	1			1								
Contusion of foot	1			1								
Color blindness	59	23	8	18	6	2				1		1
Curvature of spine	1			1								
Defective teeth	5			4	1							
Defective hearing	5	1		1	2		1					
Defective vision	83	27	7	38	9	1	1					
Debility	10			2	8							
Defective lung expansion	1			1								
Disease dependent upon animal parasites	4			3	1				1			
Abnormal rapid action of heart	5			5								
Eczema	2				1				1			
Enlarged lymph glands	1		1									
Enlarged inguinal ring	1						1					
Enlarged tonsils	2			2								
Enteric fever	1						1					
Epithelioma of eyelid	1				1							
Fistula in ano	1			1								
Flat foot	4			4								
Gastric carcinoma	1				1							
Gonorrhea	11		1	10								
Hematuria	1			1								
Hernia, inguinal	11			4	4		1			2		
Hydrocele tunica vaginalis	2				2							
Hypertrophy of tonsils	3		1	2								
Impetigo	1			1								
Influenza	2			2								
Infiltration of lung	1				1							
Induration of inguinal gland	1			1								
Incontinence of urine	1								1			
Irritability of bladder	1			1								
Inflammation of lymph glands, groin	1		1									
Inflammation of tonsils, follicular	1						1					
Malformation of foot	2			2								
Malformation of hand	3			2	1							
Malarial fever	4		1						3			
Multiple neuritis	1		1									
Nervous weakness	11	1			10							
Necrosis of femur	1								1			
Nephritis, chronic	1				1							
Opacity of cornea	3			3								
Paralysis, hemiplegia	1									1		
Pediculi pubes	1			1								
Piles, external	5			3	1					1		
Phimosis	1			1								
Poor physique	2			2								
Psoriasis	1			1								
Relaxation of abdominal ring	1			1								
Rheumatism	5		2		3							

TABLE III.—SUMMARY OF PHYSICAL EXAMINATIONS MADE BY OFFICERS OF THE PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE DURING THE FISCAL YEAR ENDED JUNE 30, 1911, EXCLUSIVE OF ALIEN IMMIGRANTS—Continued.

Summary of examinations and rejections.	Total.	Pilots.	Merchant seamen.	Revenue-Cutter Service.	Life-Saving Service.	Coast and Geodetic Survey.	Lighthouse Service.	Foreign seamen.	Immigration Service.	Civil Service Commission.	Isthmian Canal Commission.	Philippine Islands.
Causes of rejection (diseases, disability, etc.)—Continued.												
Rhinitis	1	......	......	1	......	......	....	....	......	......	....	....
Scabies	1	......	......	1	......	......	....	....	......	......	....	....
Scar on cornea	1	......	......	1	......	......	....	....	......	......	....	....
Soft chancre of penis	3	......	......	2	1	......	....	....	......	......	....	....
Synovitis, chronic	2	......	......	......	2	......	....	....	......	......	....	....
Suppuration of middle ear	1	......	......	1	......	......	....	....	......	......	....	....
Syphilis, secondary	10	......	......	8	......	1	....	....	1	......	....	....
Toxic angina (due to use of tobacco)	2	......	......	2	......	......	....	....	......	......	....	....
Trachoma	5	......	1	1	1	......	....	....	2	......	....	....
Tuberculosis	13	......	......	3	3	1	....	1	4	1	....	....
Ulcer of skin	4	......	......	3	......	1	....	....	......	......	....	....
Ulcer of penis	2	......	1	......	......	1	....	....	......	......	....	....
Underdeveloped	6	......	......	4	2	......	....	....	......	......	....	....
Under weight	9	......	......	......	7	......	....	....	......	2	....	....
Under height	5	......	......	4	......	......	1	....	......	......	....	....
Undescended testicle	1	......	......	......	......	1	....	....	......	......	....	....
Varix	1	......	......	1	......	......	....	....	......	......	....	....
Varicocele	11	......	......	9	......	......	....	1	......	1	....	....
Valvular disease of heart, mitral	11	......	......	6	2	......	1	1	......	1	....	....
Valvular disease of heart, aortic	4	......	......	4	......	......	....	....	......	......	....	....
Varicose veins	12	......	......	9	2	1	....	....	......	......	....	....
Wound of head	1	......	......	......	......	......	....	1	......	......	....	....
Wound of knee, contused	1	......	......	1	......	......	....	....	......	......	....	....
Wound of skin, lacerated	3	......	......	......	1	2	....	....	......	......	....	....

TABLE IV.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1911.

Diseases.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Total cases	**1,057**	**14,385**	**8,285**	**5,060**	**498**	**463**	**1,121**	**36,767**	**52,209**
General diseases	**447**	**5,874**	**3,274**	**2,181**	**206**	**194**	**516**	**12,648**	**18,964**
Smallpox	4	23	21	1	4	......	1	7	34
Cowpox	......	5	4	......	1	......	......	44	49
Chicken pox	......	7	7	......	......	......	......	6	13
Measles	1	62	58	1	3	......	1	16	79
Rubella	......	1	1	......	......	......	......	......	1
Scarlet fever	1	6	4	3	......	......	......	......	7
Typhus fever	......	1	1	......	......	......	......	......	1
Relapsing fever	......	2	1	1	......	......	......	......	2
Dengue	......	......	......	......	......	......	......	3	3
Influenza	5	304	231	68	5	3	2	188	497
Mumps	1	39	37	1	......	......	2	30	70
Diphtheria	1	21	19	......	......	1	2	2	24
Simple continued fever	2	19	16	3	2	......	......	13	34
Enteric fever	51	457	402	46	......	29	31	24	532
Choleraic diarrhea	......	4	4	......	......	......	......	7	11
Epidemic diarrhea	......	2	1	1	......	......	......	3	5

TABLE IV.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1911—Continued.

Diseases.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
General diseases—Continued.									
Dysentery	2	82	42	32	3	7		78	162
Beriberi		2		1		1			2
Malarial fever:									
Intermittent	20	764	659	95	8	4	18	951	1,735
Remittent		204	166	27		2	9	43	247
Phagedæna		1	1						1
Erysipelas	1	61	53	5	1	2	1	36	98
Septicemia		5	2	2		1		10	15
Tubercle	187	650	48	341	105	107	236	221	1,058
Leprosy	1	1			1		1		2
Syphilis:									
Primary	2	37	27	9	2		1	143	182
Secondary	42	742	25	682	17	2	58	2,867	3,651
Tertiary	1	18		16	1	1	1	75	94
Gonorrhea	49	830	427	384	16	1	51	4,190	5,069
Diseases dependent on animal parasites	2	186	141	39	3		5	352	540
Diseases dependent on vegetable parasites	1	5	4	1				59	65
Effects of animal poisons:							1		
Decayed and poisonous food		11	9	2				6	17
Effects of vegetable poison:									
Cocaine		1	1						1
Opium		2		2				3	5
Tobacco								15	15
Morphine		3	2		1				3
Poison ivy		1		1				10	11
Effects of inorganic poisons:									
Lead		2	2					4	6
Mercury								2	2
Ammonia		1				1			1
Carbon monoxide		1	1						1
Cyanogen gas		2	2						2
Effects of the presence of foreign bodies		4	3	1				37	41
Effects of mechanical injuries		2	1	1				3	5
Effects of heat	1	7	8					6	14
Effects of cold		1	1						1
Effects of chemical agents		3	3					2	5
Effects of excessive exertions and strain		10	8	2				3	13
Pellagra		1				1			1
Starvation		1		1					1
Scurvy		1		1					1
Alcoholism	7	231	175	48	6	3	6	185	423
Rheumatic fever	10	143	89	49		2	13	30	183
Rheumatism	37	672	467	186	9	2	45	2,284	2,993
Gout		1	1					4	5
Osteoarthritis	2	7	1	5	1		2	8	17
Cyst, sebaceous		4	3	1				40	44
New growth, nonmalignant	3	60	44	11	4		4	209	272
New growth, malignant	6	38	8	8	6	16	6	26	70
Anemia		13	5	6				25	38
Idiopathic anemia		2				1	1		2
Purpura		5	4				1	2	7
Hodgkin's disease		8		4	2	2			8
Diabetes mellitus	4	23	3	14	1	5	4	19	46
Diabetes insipidus		34	13	19	2			18	52
Leucocythaemia		3	1	1			1		3
Congenital malformations	1	7	3	2			3	3	11
Hemophilia		2	1		1				2
Debility	2	23	12	7	1		5	328	353
Old age		1					1	3	4
Local diseases.									
DISEASES OF THE NERVOUS SYSTEM	135	393	96	201	67	24	140	974	1,475
Of the nerves:									
Inflammation—									
Neuritis		56	17	32	3	1	3	88	144
Multiple neuritis		16	3	5	2		6	8	24

TABLE IV.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1911—Continued.

Diseases.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Local diseases—Continued.									
DISEASES OF THE NERVOUS SYSTEM—Continued.									
Of the spinal cord and membranes—Membranes:									
Inflammation of pia mater and arachnoid		1				1			1
Of the spinal cord and membranes—Cord:									
Inflammation—									
Diffuse	1						1		1
Local		2		2					2
Hemorrhage		1		1					1
Degeneration—									
Of anterior cornea	3	1		2	2				4
Of lateral columns	2	3	1	1	1		2		5
Of posterior columns	16	33		16	6	3	24	20	69
Of lateral and posterior columns		5		1	1		3		5
Insular	3	1		2	2				4
Of the brain and its membranes—Membranes:									
Inflammation—of dura mater		1	1						1
Of the brain and its membranes—Brain:									
Abscess								2	2
Softening	1						1		1
Hemorrhage	3	10	1	1	2	6	3	10	23
Hyperemia		1		1				2	3
Anemia general		2	1	1				6	8
Functional nervous disorders with other diseases of undetermined nature:									
Apoplexy		6	1	2	1	2			6
Paralysis—									
Paraplegia	4	5	1	5	1	2			9
Hemiplegia	23	40	2	27	5	1	28	23	86
Local paralysis	2	6	1	7				9	17
Incomplete paralysis	1	9	1		5	3	1		10
Paralysis agitans		1			1				1
Chorea		2		2				2	4
Spasm		5	5					9	14
Torticollis		2	2					8	10
Facial spasm								2	2
Occapation, neurosis neuralgic		1		1					1
Epilepsy	1	25	3	15	6		2	17	43
Vertigo		7	2	4			1	9	16
Headache		5	2	2			1	153	158
Hyperesthesia								6	6
Aphasia		4	1	2	1			2	6
Neuralgia	7	58	33	28			4	345	410
Hysteria		2		1			1	3	5
Nervous weakness	1	49	10	30	6		4	212	262
Hiccough		2	1	1				2	4
Mental diseases:									
Mania	13	5	1		5		12		18
Melancholia	5	6	3	3	2	1	2	5	16
Dementia	34	8	3	2	6	4	27	2	44
Mental stupor		3			3				3
General paralysis of the insane	8	5		2	1		10	1	14
Delusional insanity	7	4		2	5		4	1	12
DISEASES OF THE EYE	10	135	67	52	13	1	12	551	696
Conjunctivitis—									
Catarrhal—									
Acute		40	23	12	1		4	351	391
Chronic		2	2					20	22
Granular (trachoma)		9	6	2	1			3	12
Ecchymosis of conjunctiva		1	1						1
Edema of conjunctiva		1	1						1

TABLE IV.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1911—Continued.

Diseases.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Local diseases—Continued.									
DISEASES OF THE EYE—Continued.									
Keratitis		6	4	2				8	14
Ulceration of cornea	1	16	8	5	1		3	13	30
Opacity of cornea		2		2				3	5
Acquired deformities of cornea		3	1	2					3
Scleritis		1		1				2	3
Iritis	5	24	13	11	3		2	40	69
Glaucoma		2	1				1	2	4
Optic neuritis		1		1				2	3
Atrophy and degeneration of optic nerve or papilla		4		2	1		1		4
Retinitis		2		1	1			4	6
Lenticular cataract	4	5		3	4	1	1	6	15
Panophthalmitis, acute		2	2						2
Amblyopia								2	2
Ametropia		2		1	1			14	16
Disorder of accommodation, presbyopia		1		1					1
Squint		1	1					1	2
Stricture and obliteration of puncta and canaliculi		2	1	1				3	5
Abscess lacrymal sac		3	1	2				4	7
Blepharitis marginalis								8	8
Sty		1		1				46	47
Abscess of eyelid		3	1	2				8	11
Ectropion		1	1					3	4
Ptosis of eyelid								6	6
Entropin								2	2
DISEASES OF THE EAR	2	85	45	37	3		2	352	439
Inflammation of the external meatus—									
Acute		3	1	1			1	37	40
Chronic								3	3
Abscess								23	23
Hematoma of the auricle		2	1	1				2	4
Accumulation in external meatus of wax or epidermis		3	3					110	113
Inflammation of the middle ear—									
Nonsuppurative	1	11	6	6				37	49
Suppurative	1	62	32	27	3		1	105	168
Perforation of membrana tympani		4	2	2				10	14
Anchylosis of ossicles								3	3
Obstruction of Eustachian tube								4	4
Tinnitus								7	7
Deafness								11	11
DISEASES OF THE NOSE	2	36	18	16	3	1		696	734
Inflammation of soft parts		20	9	10	1			634	654
Inflammation of framework—Necrosis								3	3
Diseases of septum—Deviations		7	4	2	1			5	12
Epistaxis		4	4					16	20
Inflammation of the accessory sinuses	2	4	1	3	1	1		10	16
Inflammation of the nasopharynx		1		1				26	27
Loss of sense of smell								2	2
DISEASES OF THE CIRCULATORY SYSTEM	42	395	59	242	16	70	50	381	818
Pericarditis		2		1			1	6	8
Endocarditis		5		3		1	1		5
Valvular disease—									
Aortic	4	31	2	19		9	5	34	69
Mitral	20	115		92		28	15	50	185
Aortic and mitral	1	53		25	2	17	10	19	73
Adhesion pericardium		1		1					1
Degeneration of heart, fatty		5	1	3			1	7	12
Inflammation muscular substance of heart	1	14	2	9	1		3	11	26
Hypertrophy of heart		5		3	1		1	7	12

TABLE IV.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1911—Continued.

Diseases.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Local diseases—Continued.									
DISEASES OF THE CIRCULATORY SYSTEM—Continued.									
Dilatation of heart	1	11		6		3	3	6	18
Angina pectoris		3		3				4	7
Disordered action of the heart—									
Abnormal slowness		1		1				2	3
Abnormal rapidity		5		4	1			19	24
Irregularity	1	5		5		1		40	46
Arteritis		8		4	2	2		16	24
Degeneration of arteries—									
Arterio-capillary fibrosis	2	9		9			2	11	22
Aneurysm of arteries	4	24	2	13	3	7	3	16	44
Obstruction of arteries—									
Thrombosis		2	1	1					2
Embolism		2		1		1		2	4
Phlebitis	1	8	3	4	1		1	19	28
Varix	6	75	43	30	4		4	105	186
Thrombosis of veins	1	3	1	2		1		7	11
Dilation of capillaries		7	4	3					7
Cirsoid aneurysm		1			1				1
DISEASES OF THE RESPIRATORY SYSTEM	40	688	367	237	24	60	31	2,806	3,534
Hay fever								6	6
Inflammation of mucous membrane of larynx—									
Catarrhal, acute		19	11	8				138	157
Catarrhal, chronic								6	6
Tracheitis, catarrhal								84	84
Bronchitis—									
Catarrhal, acute	6	237	155	73	9	8	3	2,040	2,283
Catarrhal, chronic	15	63	9	53	5	5	6	253	331
Membranous		1		1					1
Spasmodic asthma	2	39	6	31			4	55	95
Congestion of lung		6	2	2		2		22	28
Hemorrhage of lung—Hemoptysis		4	1	2		1		10	14
Pneumonia	6	176	110	20		45	7	13	195
Broncho-pneumonia	1	13	7	2		3	2	2	16
Abscess of lung		2		2				3	5
Chronic interstitial inflammation	1	1		2					2
Phthisis—									
Acute		2			1	1		13	15
Chronic		3		3				2	5
Tubercular	1	4	1		2	2			5
Pleurisy—									
Acute	4	90	61	26	3	3	1	127	221
Chronic	2	14	4	7		2	3	23	39
Empyema	1	6			2	2	3	2	9
Hydrothorax		1					1		1
Adhesions of pleura								4	4
Brown induration of lung		1		1					1
Emphysema, vesicular	1	6		4	2		1	3	10
DISEASES OF THE DIGESTIVE SYSTEM	62	1,487	1,064	332	65	27	61	5,838	7,387
Ulceration of the lips		1	1					3	4
Inflammation of the mouth		5	2	1	1		1	81	86
Ulceration of the mouth		1	1					13	14
Gangrene of mouth		1				1			1
Inflammation of the dental pulp								6	6
Suppuration of the dental pulp								19	19
Caries of dentine and cementum		1	1					84	85
Inflammation of dental periosteum		4	2	2				7	11
Abscess of dental periosteum	1	11	7	3	1		1	31	43
Inflammation of gums and alveoli		2	2					15	17
Suppuration of alveoli		1	1					13	14
Ulceration of gums and alveoli		1		1				10	11

TABLE IV.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1911—Continued.

Diseases.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Local diseases—Continued.									
DISEASES OF THE DIGESTIVE SYSTEM—Continued.									
Caries of the alveoli		2	1	1				23	25
Toothache		1	1					70	71
Necrosis of alveoli		1	1						1
Atrophy of gums								2	2
Inflammation of the tongue								6	6
Ulceration of the tongue		1					1	3	4
Sore throat		28	22	5		1		293	321
Inflammation of tonsils—									
Follicular	4	137	117	24				472	613
Suppuration		34	32	2				53	87
Hypertrophy of tonsils		9	5	3	1			5	14
Elongated uvula								10	10
Inflammation of salivary glands		1		1				2	3
Salivation		1	1					3	4
Inflammation of the pharynx—									
Catarrhal		33	18	14	1			251	284
Granular								2	2
Follicular		1		1				16	17
Ulceration of palate								2	2
Ulceration of pharynx								3	3
Stricture of œsophagus		2			2			3	5
Inflammation of the stomach, catarrhal	5	117	91	24	1	1	5	420	542
Ulceration of the stomach—									
Superficial	1	31	9	19	1	1	2	3	35
Perforating		1		1					1
Dilatation of the stomach	1	1		1			1	2	4
Indigestion	6	118	83	36	3		2	1,160	1,284
Pyrosis		1	1					10	11
Volvulus		1				1			1
Vomiting		1			1			3	4
Gastralgia		3	2		1			19	22
Hemorrhage of intestines	1			1					1
Loss of appetite		1	1					50	51
Perforation of intestines		1		1					1
Inflammation of the intestines—									
Enteritis	2	47	35	9	1	3	1	84	133
Typhlitis	9	107	79	25	1	2	9	31	147
Colitis		7	4	2	1			11	18
Catarrhal		31	22	7	1		1	17	48
Vermiform appendix		19	11	3	1	1	3	26	45
Concretions of intestines		3	3						3
Fecal accumulation		14	11	3				6	20
Hernia	9	235	190	15	26	2	11	435	679
Obstruction of the intestines		4	3		1			6	10
Intestinal dyspepsia		6	5	1				16	22
Constipation	2	47	40	7	1	1		1,160	1,209
Colic		14	14					11	25
Diarrhoea	3	80	67	10	2	1	3	297	380
Enteralgia		2	2					8	10
Recto-vescical fistula	1	1		1			1	2	4
Periproctitis—Abscess	2	31	16	17				11	44
Fissure of the anus		4	3	1				16	20
Fistula in ano	2	56	36	15	4		3	26	84
Prolapse of the rectum		2		2				6	8
Prolapse of the anus		1	1						1
Ulceration of rectum		8	4	3	1			3	11
Piles—									
Internal		28	16	8	1	1	2	52	80
External		35	20	9	4		2	134	169
Mixed	2	37	22	12	3		2	23	62
Pruritus ani								15	15
Inflammation of the liver, acute		2	2					11	13
Inflammation of the liver, acute suppuration								3	3
Inflammation of the liver, chronic	4	28		16	2	7	7	31	63
Hyperemia of the liver	1	14	12	3				140	155
Accumulation of bile								10	10

TABLE IV.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1911—Continued.

Diseases.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Local diseases—Continued.									
DISEASES OF THE DIGESTIVE SYSTEM—Continued.									
Perforation, biliary fistula	1			1					1
Atrophy of the liver		1		1				3	4
Hypertrophy of the liver		1		1					1
Jaundice		17	11	6				42	59
Inflammation of hepatic ducts and gall bladder	3	30	23	6		2	2	20	53
Calculi		5	3	1			1	11	16
Biliary colic		3	2	1				3	6
Inflammation of the peritoneum	1	6	2	2	1	2			7
Dropsy	1	2	2		1				3
Adhesion of peritoneum		2		2					2
Omental hernia		1	1						1
Inflammation of pancreas		1		1					1
DISEASES OF THE LYMPHATIC SYSTEM	28	226	141	79	6	1	27	355	609
Abscess of spleen								2	2
Hyperthrophy of spleen		1		1					1
Inflammation of lymph glands—suppuration	26	216	133	75	6	1	27	319	561
Hypertrophy of lymph glands		2	1	1				23	25
Inflammation of lymphatics—suppuration	2	7	7	2				7	16
Lymph fistula								2	2
DISEASES OF THE THYROID BODY		3		2		1		13	16
Inflammation								2	2
Goiter		3		2		1		11	14
DISEASES OF THE URINARY SYSTEM	19	217	48	129	7	35	17	484	720
Acute nephritis	3	26	9	12		6	2	8	37
Bright's disease—									
Chronic nephritis	6	86	2	54	3	25	8	95	187
Granular kidney	2	26		23	1	2	2	11	39
Pyelitis	1	2	1	2				2	5
Abscess—									
Of kidney	1	3		3		1		2	6
Pyonephrosis		1					1		1
Movable kidney		2		2					2
Calculus in kidney		1		1				12	13
Calculus in ureter	2	4	2	3	1			3	9
Suppression of urine		2	2					2	4
Hematuria		5	5					3	8
Albuminuria		1				1		2	3
Lithuria								9	9
Phosphaturia								13	13
Nephralgia of kidney		3	2	1				2	5
Inflammation of bladder—									
Acute	1	25	14	9	1		2	150	176
Subacute	1	8	4	5				46	55
Chronic	1	11	2	7	1		2	58	70
Calculus of bladder		2	1	1				2	4
Irritability of bladder		2	1	1				45	47
Retention of urine	1	5	2	4				3	9
Incontinence of urine		2	1	1				16	18
DISEASES OF THE GENERATIVE SYSTEM	56	1,094	667	396	17	6	64	2,019	3,168
Urethritis		5	1	4				84	89
Gleet								31	31
Abscess of the urethra								2	2
Ulcer of the urethra								2	2
Stricture of the urethra—									
Organic	4	147	65	69	2	3	12	208	359
Traumatic		4	3	1				5	9
Hypertrophy of prepuce		4	4						4
Edema of prepuce		1		1					1
Urethral fistula		2	2					3	5
Abscess of prostate		1	1						1
Posthitis		1	1					11	12
Inflammation of the prostate—									
Acute	1	3	1	3				8	12
Chronic		1		1				11	12
Prostatarrhea		1	1					2	3

TABLE IV.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1911—Continued.

Diseases.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Local diseases—Continued.									
DISEASES OF THE GENERATIVE SYSTEM—Continued.									
Hypertrophy of the prostate	1	11	3	5	1	2	1	42	54
Phimosis	2	75	57	19			1	32	109
Paraphimosis	1	11	8	4				10	22
Inflammation of the penis—of the glans		5	5					36	41
Ulcer of penis	4	172	88	77	3		8	263	439
Edema of penis		1	1					11	12
Soft chancre	34	432	282	148	6		30	875	1,341
Impacted calculus		1	1						1
Inflammation of the scrotum								3	3
Abscess of the scrotum	1	3	2	1				7	11
Hydrocele of the spermatic cord	1	9	7	2	1			10	20
Varicocele		43	32	6	3		2	81	124
Hydrocele of tunica vaginalis		28	21	7				45	73
Inflammation of the testicle—									
Acute orchitis	4	78	48	29			5	140	222
Chronic orchitis								6	6
Epididymitis	3	46	28	16			5	62	111
Abscess of testicle		3	2	1					3
Spermatorrhea								7	7
Impotence		1			1			8	9
Hematocele tunica vaginalis		1		1					1
Inflammation of the fallopian tube		1	1						1
Inflammation of the uterus		1		1				3	4
Displacements and distortions of the uterus		1	1					3	4
Inflammation of the vagina								2	2
Lacerated perineum		1				1			1
Amenorrhea								2	2
Leucorrhea								3	3
Inflammation of mammary gland								1	1
DISEASES OF THE ORGANS OF LOCOMOTION	20	265	156	92	12	1	24	1,445	1,730
Inflammation of the bones—									
Osteitis	2	6	2	4	1		1	12	20
Periostitis		11	7	4				8	19
Caries		1	1					2	3
Necrosis		18	8	7		1	2	8	26
Hypertrophy of the bones								2	2
Inflammation of joints—									
Acute synovitis	2	38	24	12	2		2	31	71
Chronic synovitis	1	11	3	9				18	30
Suppuration	1	1	1	1					2
Ulceration of cartilage		1		1					1
Ankylosis		3	1	1			1	3	6
Dislocation of articular cartilage		2		1	1			7	9
Inflammation of spine, lumbar	3	2		2	2		1		5
Dislocation of joint								3	3
Relaxation of ligaments								2	2
Caries of the spine	2	4		4			2	5	11
Psoas, lumbar, and other abscesses		1	1						1
Lateral curvature of spine		1					1		1
Inflammation of muscles								7	7
Suppuration of muscles		4	3	1				2	6
Atrophy of muscles	2	2		1	3				4
Myalgia—									
Lumbago	3	120	77	35	3		8	1,233	1,356
Stiff neck								11	11
Inflammation of tendons		1	1					7	8
Contraction of tendons		1	1						1
Rupture of muscle								1	1
Inflammation of sheaths of tendons		5	3	2				8	13
Thecal abscess		5	3	2				2	7
Ganglion		1	1					5	6

TABLE IV.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1911—Continued.

Diseases.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Local diseases—Continued.									
DISEASES OF THE ORGANS OF LOCOMOTION—Continued.									
Inflammation of bursa—									
Acute	1	9	8				2	26	36
Chronic	1	4	4	1				11	16
Abscess of bursa		6	3	1			1	7	13
Bunion		3	1	2				3	6
Bursal cyst		2	2						2
Flat foot	2	1		1			2	21	24
Hammer toe		1	1						1
DISEASES OF THE CONNECTIVE TISSUE	16	394	273	105	8	3	21	677	1,087
Inflammation	4	163	125	34	2	2	4	202	369
Abscess	11	219	141	68	4		17	470	700
Gangrene	1	2	2	1				3	6
Edema		4	3	1					4
Hemorrhage		1			1				1
Elephantiasis		2			1	1			2
Gangrene		3	2	1					3
Undue formation of fat								2	2
DISEASES OF THE SKIN	31	443	285	162	8	2	17	2,248	2,722
Erythema		4	3	1				19	23
Urticaria	1	6	5	2				70	77
Prickly heat		1	1					16	17
Eczema	3	46	24	23	1		1	416	465
Impetigo		6	3	3				18	24
Pityriasis rubra	1	2		2		1		8	11
Prurigro		1		1				7	8
Lichen		1		1				2	3
Psoriasis	2	12	4	9	1			46	60
Herpes		2	1	1				78	80
Zona		9	6	3				34	43
Pemphigus		1	1					2	3
Dermatitis herpetiformis		9	8	1				11	20
Acne		3		2			1	79	82
Sycosis		1		1				13	14
Seborrhoea								11	11
Leucodermia								3	3
Gangrene		1		1					1
Sudamina								3	3
Chilblain		1	1					14	15
Ulcer	18	184	116	72	2		12	504	706
Cicatrices		1		1					1
Boil	2	78	55	20	2		3	609	689
Carbuncle	1	29	23	6		1		82	112
Whitlow		15	7	8				80	95
Onychia	1	12	9	3	1			52	65
Corn		3	3					31	34
Ainhum		1	1						1
Cheloid		1	1						1
Wen		8	8					16	24
Hyperidrosis								6	6
Pruritus								8	8
Lupus	2	2	2	1	1			3	7
Adenoma sebaceum		1	1						1
Tylosis		2	2					5	7
Choloasma								2	2
Injuries	**7**	**184**	**76**	**38**	**1**	**17**	**9**	**181**	**322**
GENERAL INJURIES:									
Effects of heat—									
Burns and scalds	3	100	50	28	1	16	8	143	246
Heat stroke	1	10	10				1	13	24
Effects of cold		7	7					3	10
Effects of chemical irritants and corrosives								17	17
Multiple injury	2	11	6	6		1		5	18
Suffocation	1			1					1
Exhaustion		3	1	2					3
Shock		3	2	1					3

TABLE IV.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1911—Continued.

Diseases.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Injuries—Continued.									
LOCAL INJURIES	140	2,517	1,649	829	37	12	130	5,126	7,778
Contusion of nerves								6	6
Compression of nerves		1		1					1
Rupture of nerves								2	2
Rupture of vein								2	2
Contusion of gland		1	1						1
Contusion of parotid gland		1		1					1
Contusion of muscles		8	3	5				5	13
Strain of muscles		13	10	3				65	78
Rupture of muscles		3	3						3
Strain of tendons		1	1					9	10
Rupture of tendons		1	1						1
Wound of tendons								5	5
Contusion of skin		7	5	2				9	16
Abrasion of skin		4	2	2				92	96
Wound of skin		4	3	1				40	44
Burn or scald of skin	9	115	81	39	1		3	185	309
Frostbite		9	6	3				29	38
Effects on the skin of irritants or corrosives								5	5
Abrasion of mucous membrane								13	13
Burn or scald of mucous membrane		4	4					9	13
Contusion of scalp	1	5	4	1				31	37
Wound of scalp	3	78	46	32	1		2	208	289
Contusion of skull		4	1	3				2	6
Fracture of the vault of skull	3	6	2	4	2	1		2	11
Fracture of the base of skull		7	2	3		1	1		7
Wound of skull		2		1			1		2
Concussion of brain		13	9	3		1		2	15
Laceration of brain		3	2	1					3
Contusion of face		23	18	4			1	44	67
Wound of face and mouth	1	62	44	17			2	128	191
Fracture of facial bones	5	36	15	20	3		3	7	48
Dislocation of nasal cartilages								2	2
Contusions of eyelid	1	8	6	3				24	33
Wound of eyelid		4	2	1	1			11	15
Chemical injuries of eyelid								3	3
Wound of conjunctiva		2	2					6	8
Contusion of eyeball		4	1	3				11	15
Foreign body in eyeball								14	14
Foreign bodies in the conjunctiva or cornea		7	4	3				115	122
Wound of eyeball	1	5	4	2				4	10
Contusion of pinna								6	6
Hematoma of pinna								2	2
Wound of pinna	1		1					11	12
Rupture of membrana tympani		1	1						1
Foreign body in external meatus								3	3
Gunshot wounds	3	11	5	3		2	4	3	17
Fracture of spine with displacement		3					3		3
Simple fracture of spine with injury of cord		2		2					2
Contusion of neck		4	3	1				6	10
Wound of neck		4	2	2				6	10
Contusion of chest	1	41	24	14	2		2	136	178
Dislocation of costal cartilages		2		2				3	5
Fracture of ribs	5	95	60	35			5	81	181
Wound of parietes of chest		7	2	5				6	13
Penetrating wound of pleura or lung		1		1					1
Contusion of back		72	49	19			4	99	171
Sprain of back	1	30	27	3			1	60	91
Wound of back		7	4	3				8	13
Fracture of spine	2			1	1				2
Concussion of cord		2		2				2	4
Contusion of abdomen	1	7	8					10	18
Wound of parietes of abdomen		6	3	1		2		5	11
Contusion of the pelvis		4	3		1			7	11

TABLE IV.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1911—Continued.

Diseases.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Injuries—Continued.									
LOCAL INJURIES—Continued.									
Contusion of the perineum, scrotum, or penis		5	5					2	7
Wound of the male urethra, perineum, scrotum, testis, or penis		8	6	2				9	17
Dislocation of spine		1		1					1
Wound of rectum								2	2
Rupture of urethra		4	2	2					4
Foreign body in the rectum		1	1						1
Fracture or dislocation of pelvic bones	2	3	4			1			5
Contusion of testicle		4	3	1				6	10
Contusion of upper extremities	3	115	94	18			6	595	713
Sprain of shoulder		11	5	4			2	26	37
Sprain of elbow		6	2	4				4	10
Sprain of wrist	1	28	20	6			3	138	167
Sprain of hand		4	3	1				15	19
Sprain of thumb		1	1					24	25
Sprain of back								6	6
Wound of upper extremities	12	362	213	146	5		10	1,472	1,846
Wound of joint, upper extremities		2	1	1				7	9
Fracture of clavicle	6	22	17	10			1	6	34
Fracture of scapula	1	2	1				2	3	6
Fracture of humerus	5	34	18	17	2		2	15	54
Fracture of bones of forearm—									
Radius	4	31	17	14	1		3	31	66
Ulna		19	9	9			1	16	35
Both bones	1	19	9	8			3	10	30
Fracture of carpus, metacarpus, or phalanges	3	36	22	16	1			81	120
Dislocation of clavicle	1	5	4	2				6	12
Dislocation of scapula		1	1						1
Dislocation of humerus		39	20	17			2	7	46
Dislocation of radius and ulna		3		1	1		1	3	6
Dislocation of phalanges of thumb		1		1					1
Dislocation of phalanges of fingers		3	2	1				5	8
Contusion of lower extremities	9	300	196	101	2	1	9	493	802
Sprain of hip	1	6	5	1			1	7	14
Sprain of knee		22	12	8			2	46	68
Sprain of ankle	7	169	115	48	2		11	135	311
Sprain of foot	1	8	6	3				17	26
Wound of lower extremities	16	298	239	62	3	1	9	338	652
Wound of joint, lower extremities	1	4	3	2				5	10
Fracture of femur	11	21	15	13	1		3	3	35
Fracture of cervix femoris		1		1					1
Fracture of patella		3	3						3
Fracture of tibia	3	48	20	14	3		14	7	58
Fracture of fibula	3	28	21	6	1	1	2	6	37
Fracture of tibia and fibula	7	50	28	19	1	1	8	9	66
Fracture of bones of foot—									
Of the tarsus		3	2	1				3	6
Of the metatarsus	2	18	8	11			1	3	23
Of the phalanges of the toes	1	11	10	1			1	5	17
Dislocation of femur	1	4	2	1	2				5
Dislocation of patella		1	1					2	3
Dislocation of tibia								2	2
Dislocation of fibula		1	1						1
Dislocation of foot		1		1					1
Dislocation of metatarsus and phalanges		5	3	2				3	8
Injuries of bursæ		2	1				1	6	8
Dislocation of astragulus		2	2						2
Dislocation of calcis		1	1						1

TABLE V.—COMPARATIVE EXHIBIT—RATIO OF DEATHS FROM SPECIFIC CAUSES, 1901–1911.

Deaths from—	General average.	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911
General diseases	48.46	44.01	48.06	49.49	53.46	51.52	52.17	44.92	50.00	49.03	41.90
Diseases of the—											
Nervous system	5.63	7.29	5.36	5.30	6.32	4.87	6.72	5.06	6.51	3.67	5.18
Circulatory system	11.45	12.23	10.72	8.76	11.88	11.16	10.47	12.06	8.74	13.39	15.12
Respiratory system	12.06	13.54	11.64	14.66	8.81	9.13	11.06	13.42	9.87	13.60	14.90
Digestive system	6.60	7.55	7.39	7.33	4.79	5.88	5.34	4.67	10.08	7.13	5.83
Genito-urinary system	6.75	4.94	6.65	6.72	5.74	6.09	5.54	10.13	7.85	4.97	8.86
Injuries	6.89	7.55	6.47	5.09	7.09	9.13	7.12	7.20	5.61	7.34	6.26
From all other causes	2.16	2.86	3.71	2.65	1.91	2.22	1.58	2.54	1.34	.87	1.95

TABLE VI.—NATIVITIES OF PATIENTS TREATED IN HOSPITALS DURING THE FISCAL YEAR ENDED JUNE 30, 1911.

Countries.	Number.	Countries.	Number.
Total	15,442	Hayti	3
		Hawaii	59
Alaska	3	Holland	58
Argentine Republic	7	Honduras	4
Austria	160	India	5
Australia	33	Ireland	596
Azores	5	Italy	69
Bahama Islands	17	Jamaica	47
Bermuda Islands	3	Japan	48
Barbadoes	10	Korea	2
Belgium	28	Mexico	28
Brazil	5	New Brunswick	19
British Guiana	10	Newfoundland	90
British West Indies	33	Norway	1,142
Bulgaria	4	Nova Scotia	177
Canada	243	Panama	7
Cape Breton	15	Paraguay	3
Cape Verde Islands	66	Peru	7
Chili	23	Philippine Islands	35
China	7	Poland	42
Columbia	7	Portugal	88
Cuba	5	Porto Rica	39
Curacao	8	Prince Edward Island	23
Denmark	219	Roumania	8
Dutch Guiana	3	Russia	224
Dutch West Indies	19	Servia	5
East Indies	3	Scotland	185
Ecuador	3	Spain	257
Egypt	3	Sweden	759
England	491	Switzerland	25
Finland	360	Turkey	14
France	68	United States	8,322
Grand Cayman	15	Wales	24
Germany	985	West Indies	37
Greece	107	All other countries	23

TABLE VII.—SURGICAL OPERATIONS, FISCAL YEAR 1911.

Operations.	Number of cases.
Total number of operations	**1,886**
Post-operative mortality	24
TUMORS: Excision of	30
Carcinoma	2
Endothelioma	1
Epithelioma	8
Fibro-lipoma	5
Fibroma	2
Keloid	1
Lipoma	1
Neuroma	1
Osteoma	1
Papilloma	5
Sarcoma	2
Unqualified	1
CYSTS: Excision of	23
Cyst of epididymis	1
Cyst of cheek	1
Cyst of eyelid	1
Cyst of neck	1
Cyst of scrotum	1
Cyst of tonsil	1
Sebaceous cyst	17
FOREIGN BODIES: Removal of	7
From—	
Back	1
Conjunctiva	1
Cornea	2
Upper extremity	3
ABSCESSES: Incision and drainage	121
Connective tissue of—	
Abdominal wall	3
Alveola	2
Axilla	9
Back	2
Buttock	1
Ear	1
Face	5
Ischeo-rectal fossa	9
Jaw	1
Lumbar region	1
Lower extremity	20
Neck	9
Parasternal region	1
Perineum	5
Perirectal region	17
Peritonsilar region	3
Periurethral region	1
Scalp	1
Scrotum	3
Upper extremity	27
BLOOD VESSELS	98
Arteries—	
Excision popliteal aneurysm	1
Ligation to control hemorrhage	4
Veins—	
Excision of nævus	2
For varix—	
Ligation	3
Phlebectomy (unqualified)	41
Mayo operation	3
Schede operation	6
Incision and drainage for periphlebitis	1
Intravenous injection of Salvarsan for secondary syphilis	37
NERVES	3
Avulsion supra and infra orbital	1
Neurectomy	1
Suture	1
LYMPHATIC GLANDS	330
Enucleation—	
Axillary	8
Cervical	5
Inguinal (bubo)	126
Excision, new growth nonmalignant	2
Incision and drainage for suppuration—	
Cervical	2
Femoral	1
Inguinal (bubo)	185
Unqualified	1
SKIN AND SUBCUTANEOUS TISSUE	87
Application of carbon dioxide snow for—	
Lupus	2
Rodent ulcer	1
Cauterization for chronic ulcer	2
Curettage for ulcer	2
Excision of—	
Condyloma	1
Scar tissue	4
Incision and drainage for—	
Erysipelas	2
Inflammation	3
Cellulitis	1
Wound, infected	27
Wound, lacerated	1
Operation for onychia	9
Skin grafting for—	
Burn	9
Chronic ulcer	7
Granulating wound	1
Webbed fingers (plastic)	1
Suture and dressing for wound of—	
Lip	2
Lower extremity	3
Scalp	3
Upper extremity	6
TRACHEA	1
Tracheotomy, for emphysema, tissues of neck	1
BONES	104
Simple fracture, reduction, splints, or extension—	
Clavical	1
Colles	1
Elbow joint	1
Femur	2
Fibula	1
Humerus	6
Phalanges	1
Pott's	1
Radius	1
Radius and ulna	1
Rib	4
Tibia	7
Tibia and fibula	3
Ulna	1
Unqualified	2
Bone exposed and wired—	
Maxilla, inferior	1
Patella	2
Tibia and fibula	1
Radius and ulna	1

TABLE VII.—SURGICAL OPERATIONS, FISCAL YEAR 1911—Continued.

Operations.	Number of cases.
BONES—Continued.	
Bone exposed—	
Loose fragments removed, internal condyle of femur	1
Lane's bone plates applied	1
Compound fracture—	
Amputation—	
Finger	3
Hand	1
Leg	5
Thigh	1
Toe	2
Unclassified	1
Reduction, wiring, or splints—	
Maxilla, inferior	1
Phalanx	2
Tibia	2
Tibia and fibula	4
Fracture, dislocation, reset, splints—	
Elbow joint	1
Toe	1
Incision and drainage, for caries, costal cartilage	1
Nonunion, wiring, and splints—	
Clavical	1
Patella	1
Tibia	1
Removal silver wire	1
Resection or currettage of portion of bone for injury, disease, or necrosis—	
Clavical	1
Femur	3
Humerus	1
Maxilla, inferior	6
Maxilla, superior	2
Metacarpal bone	1
Metatarsal bone	2
Os calcis (exostosis)	1
Patella	1
Phalanx	2
Rib	1
Tibia	8
Unqualified	5
Reset for deformity	1
JOINTS	33
Arthrectomy (resection) for tubercle knee joint	1
Arthrotomy and drainage—	
Hip	1
Knee	4
Shoulder	1
Arthrotomy—	
Removal of loose cartilage	1
Exploratory, knee	1
Aspiration, knee joint	5
Irrigation and injection of iodoform emulsion for tubercle, knee joint	1
Operation for halux valgus (bunion), Mayo operation	1
Reduction of dislocation of—	
Ankle	1
Carpus	1
Costal cartilage	1
Elbow	2
Hip	1
Radius and ulna	1
Shoulder	6
Tarso-metatarsal joint	2
Toe	2
MUSCLES, TENDONS, AND FASCIA	10
Excision of fascia, for—	
Contracted palmar fascia	1
Dupuytren's contracture	2
Excision of ganglion	1
Incision and drainage, for thecitis	1
Tenorrhaphy	4
Tenotomy, club foot	1

Operations.	Number of cases.
BURSAE	7
Excision for inflammation	2
Incision and drainage, for—	
Inflammation	1
Abscess	4
AMPUTATIONS	71
For disease or injury of—	
Fingers	41
Foot	2
Forearm	1
Hand	2
Leg	4
Thigh	1
Toes	20
SKULL	13
Decompression, for fracture, compound	1
Excision—	
Sinus, frontal bone	1
Necrosed bone	1
Mastoid operation	2
Trephining, for—	
Contusion	1
Fracture	1
Epilepsy	1
Frontal sinusitis	3
Mastoiditis	1
Suppurative otitis media	1
SPINE AND SPINAL CORD	2
Incision and drainage, for tubercular abscess	1
Lamenectomy, for fracture of vertebrae	1
FACE, NASAL CAVITIES, AND MOUTH	39
Excision of—	
Hypertrophied nasal mucous membrane	1
Nasal septum	12
Nasal polypus	5
Tonsils	9
Uvula	2
Haemostasis, for epistaxis, tampon	2
Incision and drainage, for suppurative tonsillitis	1
Reduction of dislocation of nasal cartilage	1
Turbinectomy	5
Uranoplasty, cleft palate	1
EYE	23
Decission of capsule, for soft cataract	2
Enucleation of eyeball, for—	
Injury	3
New growth, malignant	1
Extraction of lens, for cataract	2
Excision of pterygium	5
Expression of trachoma granules	1
External canthroplasty, for ectropion	1
Iredectomy, for glaucoma	1
Probing and slitting, for stricture of puncta	1
Tenotomy, for strabismus	6
EAR	4
Incision and packing for hematoma of auricle	1
Meatotomy	1
Perforation of membrana tympani for suppurative otitis media	2

TABLE VII.—SURGICAL OPERATIONS, FISCAL YEAR 1911—Continued.

Operations.	Number of cases.
THORAX	13
Thoracentesis for—	
Empyema	2
Pleurisy, chronic	1
Pleurisy with effusion	2
Resection of rib for—	
Abscess of liver	1
Caries, costal cartilage	1
Drainage of pulmonary cavity	1
Empyema	5
ABDOMEN	314
Abdominal section for—	
Appendectomy, closure	66
Appendectomy, drainage	8
Cholectotomy, drainage	2
Colotomy, inguinal, for cancer of rectum	1
Drainage, abscess of liver	3
Drainage, abscess iliac glands	1
Entero-enterostomy for—	
Stricture of colon	1
Tubercle of colon	1
Enterorrhaphy for—	
Gunshot wound	3
Typhoid perforation	1
Exploration for—	
Hypertrophy of liver	1
Stab wound	1
Gastro-enterostomy for carcinoma of stomach	2
Gastrorrhaphy for perforating gastric ulcer	1
Gastrostomy, cancer of stomach	1
Gastric lavage for ptomaine poisoning	1
Hernioplasty for—	
Femoral hernia	2
Incarcerated inguinal (Bassini)	1
Inguinal hernia—	
Bassini operation	153
Bloodgood operation	1
Ferguson operation	13
Halsted operation	3
Modified Bassini	5
Rectus transplantation	2
Unclassified	24
Strangulated inguinal hernia	7
Umbilical hernia (Mayo)	2
Ventral hernia (Mayo)	10
Paracentesis for ascites	5
RECTUM AND ANUS	125
Excision of—	
Abscess (tubercle) pararectal	3
Paraanal sinus	1
Ulcer (tubercle) of anus	2
Fistula in ano—	
Division of sphincter	1
Excision	3
Incision	44
Unqualified	5
Hemorrhoids—	
External—	
Clamp and cautery	3
Excision	10
Injection	1
Ligation	4
Whitehead operation	1
Internal—	
Clamp and cautery	8
Dilatation of sphincter	2
Excision	11
Mixed—	
Clamp and cautery	5
Excision	11
Ligation	10
KIDNEY	5
Incision and drainage for abscess of kidney	1
Exploration for nephralgia	1
Nephrectomy for pyonephritis	1
Nephritis	1
Nephropexy for movable kidney	1
URINARY BLADDER	4
Suprapubic cystotomy for—	
Calculus	1
Cystitis, gonorrheal	1
Perineal fistula and urethral stricture	1
Retention of urine	1
URETHRA	38
Excision of urethral fistula	1
Incision for impacted calculus and abscess	1
Organic stricture—	
Gradual dilatation	4
Perineal section	4
Rapid dilatation	1
Urethrotomy, external	12
Urethrotomy, internal	12
Urethrotomy, external and internal	2
Urethroplasty for sloughing	1
MALE ORGANS OF GENERATION	280
Penis:	
Amputation for carcinoma	1
Circumcision for—	
Chancroid	6
Pharaphimosis	8
Phimosis	124
Redundant prepuce	2
Syphilis, primary	6
Ulcer	4
Curettage for ulcer	1
Dorsal incision for—	
Pharaphimosis	8
Phimosis	10
Excision of venereal warts	1
Incision and drainage for cellulitis	1
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Doyen operation	8
Excision of sac	13
Incision	2
Tapping	8
Volkmann operation	1
Unclassified	3
Operations for varicocele—	
Ligation and cutting veins	3
Phlebectomy	39
Unqualified	3
Prostate—	
Incision and drainage for abscess	2
Prostatectomy for hypertrophy	4
Scrotum, incision and drainage for haematocele	2
Spermatic cord, evacuation of abscess	1
Testicle—	
Castration for—	
Abscess	1
Haematocele	1
Hydrocele	1
New growth, malignant	3
Orchitis, chronic	2
Tubercle	11
Incision and drainage for—	
Abscess	1
New growth, malignant	1
Vas deferens, vasectomy, for tubercle	1

TABLE VII.—SURGICAL OPERATIONS, FISCAL YEAR 1911—Continued.

Operations.	Number of cases.	Operations.	Number of cases.
FEMALE ORGANS OF GENERATION	4	GUNSHOT WOUNDS	7
Anterior fixation for prolapsus uteri	1	Abdomen	2
Hysterectomy for new growth, nonmalignant	1	Knee	1
Perineorrhaphy for laceration of perineum	1	Leg	1
Salpingo-oöphorectomy for suppuration tube and ovary	1	Thigh	2
CARBUNCLE	12	Unqualified	1
Excision	2	GANGRENE	11
Incision and drainage	10	Amputation of—	
		Fingers	7
		Foot	1
		Leg, diabetes	2
		Multiple incision and drainage, buttock	1
		MINOR OPERATIONS NOT QUALIFIED	44

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